



INDIANA DEPARTMENT OF TRANSPORTATION

STANDARDS COMMITTEE MEETING AGENDA

Driving Indiana's Economic Growth

October 30, 2006

MEMORANDUM

TO: Standards Committee

FROM: Dannie L. Smith, Secretary

RE: Agenda for the November 16, 2006 Standards Committee Meeting

A Standards Committee meeting is scheduled for 9:00 a.m. on November 16, 2006 in the N755 Bay Window Conference Room. The following agenda items are listed for consideration.

Old Business

Item 16-1 211	Mr. Heustis B Borrow Fill and Structure Backfill	11/16/06 200-69	3
Item 16-6 Policy Change	Ms. Rearick Semi-Integral End Bents	11/16/06	8
Item 16-7 Design Manual	Ms. Rearick Figures 67-1C(1) and 67-1C(2)	11/16/06	10
Item 16-8 702.02	Ms. Rearick Materials	11/16/06 700-17	17
Item 16-9 702.23	Ms. Rearick Waterproofing	11/16/06 700-42	18
Item 16-10 702.27	Ms. Rearick Method of Measurement	11/16/06 700-44	19
Item 16-11 702.28	Ms. Rearick Basis of Payment	11/16/06 700-44	20
Item 16-12 714.03.1 714.07 714.08	Mr. Heustis Backfill Method of Measurement Basis of Payment	11/16/06 700-102 700-104 700-104	21

Item 16-13	Mr. Heustis	11/16/06	23
715.02	Materials	700-105	
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715.14	Basis of Payment	700-114	
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904.05	Structure Backfill	900-35	
Item 16-18	Ms. Rearick	11/16/06	29
906.02(a)5	<i>Neoprene Sheeting</i>	900-40	
Item 16-20	Ms. Rearick	11/16/06	30
906.08	<i>High Density Plastic Bearing Strips</i>	900-43	
<u>New Business</u>			
Item 17-1	Ms. Rearick	11/16/06	31
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Standard Drawings	715-BKFL 01 thru 10		
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203.08	Borrow or Disposal	200-21	

cc: Committee Members (11)
 FHWA (4)
 ICI Representative (1)

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 211, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 211 – B BORROW ~~FILL~~ AND STRUCTURE BACKFILL

211.01 Description

This work shall consist of backfilling excavated or displaced peat deposits; filling up to designated elevations of spaces excavated for structures and not occupied by permanent work; constructing bridge approach embankment; and filling over structures and over arches between spandrel walls, all with special material.

MATERIALS

211.02 Materials

Materials shall be in accordance with the following.

B Borrow	As Defined*
Geotextile	918.02
Structure Backfill	904

- * The material used for special filling shall be of acceptable quality, free from large or frozen lumps, wood, or other extraneous matter and shall be known as B borrow. It shall consist of suitable sand, gravel, crushed stone, ACBF, GBF, or other approved material. The material shall contain no more than 10% passing the No. 200 (75 µm) sieve and shall be otherwise suitably graded. The use of an essentially one-size material will not be permitted unless approved.

Aggregate for end bent backfill shall be No. 8 or No. 9 crushed stone, or ACBF, class D or higher.

The Contractor has the option of either providing B borrow or structure backfill from an established CAPP source, or supplying the material from another source. The Contractor has the following options for supplying B borrow or structure backfill from a local site:

- (a) the establishment of a CAPP Producer Yard at the local site in accordance with 917; or
- (b) use a CAPP Certified Aggregate Technician or a consultant on the Department's list of approved Geotechnical Consultants For Gradation Control Testing.

For material excavated within the project limits, gradation control testing will be performed by the Department if the Contractor is directed to use the material as B borrow or as structure backfill.

The frequency of gradation control testing shall be one test per 2000 t (2000 Mg) based on production samples into a stockpile or by over the scales measurement, with a minimum of two tests per contract (one in the beginning and one near the mid-point). The sampling and testing of these materials shall be in accordance with applicable requirements of 904 for fine and coarse aggregates. The Contractor shall advise, in

writing, the Engineer and the District Materials and Testing Engineer of the plan to measure the material.

~~When~~ *Where* structure backfill is specified, the Contractor may substitute flowable backfill in accordance with 213. However, flowable backfill shall not be placed into or through standing water, unless approved in writing.

CONSTRUCTION REQUIREMENTS

211.03 General Requirements

If B borrow or structure backfill is obtained from borrow areas, the items of obtaining the areas, their locations, depths, drainage, and final finish shall be in accordance with 203.

Unless otherwise specified, if excavated material complies with 211.02 and if B borrow or structure backfill is required for special filling, the excavated material shall be used as such. If there is a surplus of this material, such surplus shall be used in embankment. The provisions of 203.19 shall apply to placing this material at structures. All surplus in excess of the directed or specified use on the right-of-way shall be disposed of in accordance with 201.03.

If fill or backfill as described in this specification is within embankment limits, and if it is not required that the entire fill or backfill be of B borrow and placed as such, then that portion above the free-water level shall be placed in accordance with applicable provisions of 203 and compacted to the required density.

If borrow is required outside the specified limits of B borrow, material in accordance with the specifications for B borrow may be furnished at the contract unit price for borrow; however, the quantity of borrow measured for payment outside the limits of structure backfill will not exceed the theoretical quantity of B borrow furnished.

Unless otherwise specified, all spaces excavated for and not occupied by bridge abutments and piers, if within embankment limits, shall be backfilled to the original ground line with B borrow, and placed in accordance with 211.04.

Where B borrow or structure backfill is required as backfill at culverts, retaining walls, sewers, manholes, catch basins, and other miscellaneous structures, it shall be compacted in accordance with 211.04.

Where specified, aggregate for end bent backfill shall be placed behind end bents and compacted in accordance with 211.04. Prior to placing the aggregate, a geotextile shall be installed in accordance with 616.11.

211.04 Mechanical Compaction

~~Where B borrow or and structure backfill is to shall be compacted by mechanical compaction, it shall, unless otherwise specified, be placed with mechanical tamps or vibrators in accordance with the applicable provisions of 203.23 except, if mechanical tamps or vibrators are used, the material shall be deposited in approximately 6 in. (150 mm) lifts, loose measurements, and each lift compacted to density requirements except as otherwise set out herein.~~

Aggregate for end bent backfill and coarse aggregate No. 8, No. 9, or No. 11 used for structure backfill shall be deposited in layers not to exceed 12 in (300 mm) loose measurement. Each layer shall be mechanically compacted with a compactor having a plate width of 17 in. (425 mm) or larger that delivers 3000 to 9000 lb (13.3 to 40 kN) per blow. Each lift shall be compacted with two passes of the compactor.

211.05 Embankment for Bridges

When special filling is required, the embankment for bridges shall be constructed using B borrow within the specified limits shown on the plans. All embankment construction details specifically set out in this specification for embankment for bridges shall be considered in accordance with the applicable requirements of 203.

At the time B borrow is being placed for approach embankment, a well compacted watertight dam shall be constructed in level lifts, the details of which are shown on the plans. Except as hereinafter specified for material to be used in constructing the enclosing dam, and for growing vegetation, and unless otherwise provided, the material for constructing bridge approach embankment shall be B borrow compacted by mechanical methods. If approach embankment or shoulders are constructed of material not suitable for growing seed or sod, and if one or both of these is required, then such areas shall, unless otherwise specified, be covered with a layer of clay, loam, or other approved material. This layer shall be approximately 1 ft (0.3 m) thick after being compacted into place.

211.06 B Borrow Around Bents

When specified, B borrow shall be placed around all bents falling within the limits of the approach grade as shown on the plans. Before placing, the surface of the ground on which it is to be placed shall be scarified or plowed as directed. The embankment slope shall be 2:1 on the sides and beneath the structure, and shall be 6:1 from the end of the bridge down to the average ground line, or it may be required to complete the approaches back to the existing grade. An enclosing dam and provisions for growing vegetation shall be constructed in accordance with 211.05.

~~211.07 Aggregate For End Bent Backfill Blank~~

~~When specified, coarse aggregate shall be placed behind end bents as shown on the plans. The material shall be deposited in lifts not to exceed 12 in. (300 mm) loose measurement, and each lift shall be mechanically compacted using a hand held vibratory plate compactor having a plate width of 17 in. (425 mm) or larger that delivers 3000 to 9000 lb (13.3 to 40 kN) per blow. Each lift shall be compacted with two passes of the compactor.~~

~~Prior to placing the aggregate, a geotextile shall be installed in accordance with 616.11.~~

211.08 Spandrel Filling

Unless otherwise specified, spandrel fills for arch structures shall be composed of B borrow. The fill shall be carried up symmetrically in lifts from haunch to crown and simultaneously over all piers, abutments, and arch rings. Compaction shall be in accordance with 211.04.

211.09 Method of Measurement

B borrow, structure backfill and aggregate for end bent backfill will be measured by the cubic yard (cubic meter) as computed from the neat line limits shown on the plans, or as adjusted. If cubic yards (cubic meters) are set out as the pay item for B borrow or structure backfill in the Schedule of Pay Items and if neat line limits are not specified for measurement of volume for the material, measurement will be made by the cubic yard (cubic meter) at the loading point in truck beds which have been measured, stenciled, and approved. The B borrow may be weighed and converted to cubic yards (cubic meters) by assuming the weight per cubic foot (mass per cubic meter) to be 90% of the maximum wet density in accordance with AASHTO T 99. The material may be cross sectioned in its original position and again after excavation is complete, and the volume computed by the average end area method. If B borrow is used for backfill in areas where unsuitable material is present or peat excavation has been performed, unless otherwise directed, the B borrow will be cross sectioned, and the volume will be computed by the average end area method.

If the material is to be paid for by the ton (megagram), it will be weighed in accordance with 109.01(b).

If the material comes from a wet source such as below water or a washing plant, and weighing is involved in the method of measurement, there shall be a 12 h drainage period prior to the weighing.

Geotextile will be measured in accordance with 616.12.

211.10 Basis of Payment

The accepted quantities of B borrow will be paid for at the contract unit price per cubic yard (cubic meter) or per ton (megagram) as specified, complete in place.

Structure backfill will be paid for at the contract unit price per cubic yard (cubic meter), based on the neat line limits shown on the plans or as adjusted for authorized changes, provided the material comes from outside the permanent right-of-way. If the Schedule of Pay Items does not contain a pay item for structure backfill and it is required to backfill pipes or culverts within the project limits, a change order will be generated to establish a unit price.

B borrow material placed outside the neat lines will be paid for as borrow when such B borrow eliminates required borrow material. Otherwise, no payment will be made for backfill material placed outside the neat lines.

Aggregate for end bent backfill will be paid for at the contract unit price per cubic yard (cubic meter), based on the neat line limits shown on the plans or as adjusted by authorized changes.

Geotextile will be paid for in accordance with 616.13.

Flowable backfill which is substituted for structure backfill will be paid for as structure backfill.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 211, CONTINUED.

If topsoil, loam, or other suitable material in accordance with 211.05 is used for expediting the growth of seed or sod, it will be paid for at the contract unit price per cubic yard (cubic meter) for borrow, unless otherwise provided.

Payment will be made under the following:

Pay Item	Pay Unit Symbol
Aggregate For End Bent Backfill.....	CYS (m3)
B Borrow	CYS (m3)
	TON (Mg)
Structure Backfill	CYS (m3)

No payment will be made under this section for material obtained within the excavation limits of the project if the Contractor is directed to use the material as B borrow or structure backfill in a pipe trench, culvert, construction of an embankment or fill, or if the Contractor uses the material for its own convenience. Material obtained from within the excavation limits of the project and which the Contractor is directed to use as B borrow or structure backfill for other purposes including replacement of undercut areas, support for a MSE wall, and end bent fill will be paid for at the contract unit price of \$5.00 per cubic yard (\$6.50 per cubic meter) for B borrow/structure backfill handling.

The cost of disposal of excavated material shall be included in the cost of the pay items in this section.

Other sections containing specific cross references:		General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision	
202.08 Pg 200-10	621.13 Pg 600-69	Frequency Manual	
202.09 Pg 200-13	714.07 Pg 700-104	Update Required? Y___ N___	
202.14 Pg 200-15	714.08 Pg 700-104	By - Addition or Revision	
203.09 Pg 200-23 (3)	715.02 Pg 700-105		
203.16 Pg 200-29	715.04 Pg 700-109	718.10 Pg 700-128	
203.27(b) Pg 200-38	715.09 Pg 700-111	719.07 Pg 700-130	
203.27(e) Pg 200-39	715.13 Pg 700-113	719.08 Pg 700-131	
203.27(f) Pg 200-40 (3)	715.14 Pg 700-114	720.03 Pg 700-134 (2)	
204.02 Pg 200-44	717.04 Pg 700-123	802.11 Pg 800-28	
204.03 Pg 200-45	717.08 Pg 700-124	802.12 Pg 800-29	
206.07 Pg 200-55 (2)	717.09 Pg 700-124	807.05 Pg 800-50	
212.02 Pg 200-74	718.09 Pg 700-127	904.01 Pg 900-25	
Recurring Special Provisions potentially affected:		Standard Sheets potentially affected:	
714-R-437	723-R-282	715-BKFL-01 thru 12	
717-R-152	723-R-282f		
Motion: Mr.		Action: Passed as submitted; revised	
Second: Mr.		Effective - _____ Letting	
Ayes:		_____ Supplementals	
Nays:		Withdrawn	
		Received FHWA Approval? _____	

POLICY CHANGE

Semi-Integral End Bents

Revises Indiana Design Manual Section 67-1.01

Other sections containing
specific cross references:

None

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

None

Standard Sheets potentially affected:

None

Motion: M

Second: M

Ayes:

Nays:

Action: Passed as submitted; revised

Effective: _____ Letting

_____ 2008 Standards Specifications Book

_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____

DESIGN MEMORANDUM No. 06-__
POLICY CHANGE

TO: All Design, Operations, and District Personnel, and Consultants

FROM: _____
Anthony L. Uremovich
Design Resources Engineer
Production Management Division

SUBJECT: Semi-Integral End Bents

REVISES: *Indiana Design Manual Section 67-1.01*

EFFECTIVE: _____, 2006, Letting

Semi-integral end bents should be considered for each bridge for which integral end bents are not practical or feasible. For a skew angle of greater than 30 deg or an expansion length of 250 ft (80 m) or longer, twisting or racking of the bridge should be investigated.

Indiana Design Manual Figure 67-1C(1) shows details for Method 1, and Figure 67-1C(2) shows details for Method 2. Both figures are attached hereto. All applicable information shown in the figures should be shown on the plans.

Recurring Special Provision 702-B-____, attached hereto and regarding plastic bearing strip, and neoprene sheeting, materials required in the construction of semi-integral end bents, should be called for beginning with the _____, 2007, letting, and through the _____, 2007, letting. Beginning with the September __, 2007, letting, the recurring special provision will be incorporated into the INDOT *Standard Specifications*. The provision will then no longer be required to be called for in specific contracts.

Item No. 16-7
Ms. Rearick
Date: 11/16/06

REVISION TO DESIGN MANUAL

FIGURES 67-1C(1) Suggested Semi-Integral End Bent Details (Method 1)

FIGURES 67-1C(2) Suggested Semi-Integral End Bent Details (Method 2)

Other sections containing
specific cross references:

None

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

None

Standard Sheets potentially affected:

None

Motion: M

Second: M

Ayes:

Nays:

Action: Passed as submitted; revised

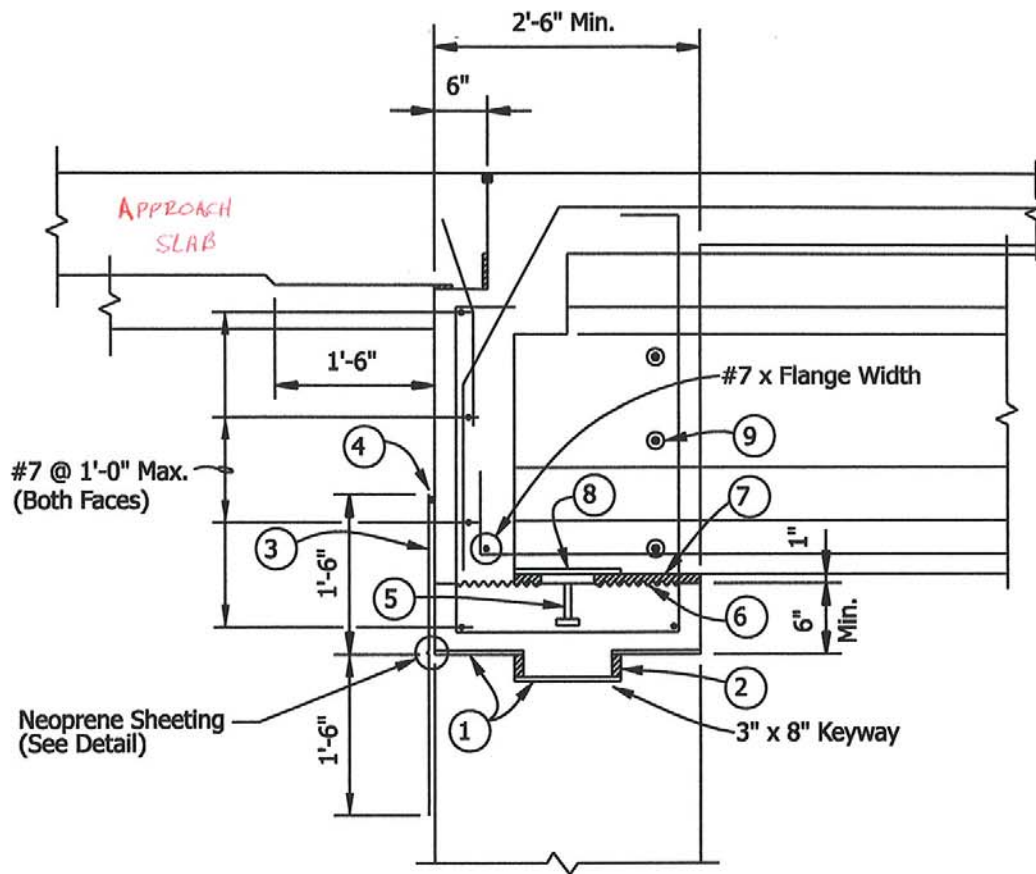
Effective: _____ Letting

_____ 2008 Standards Specifications Book

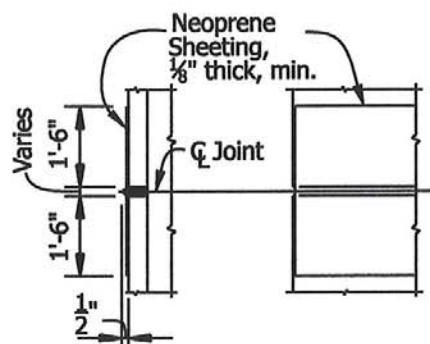
_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____



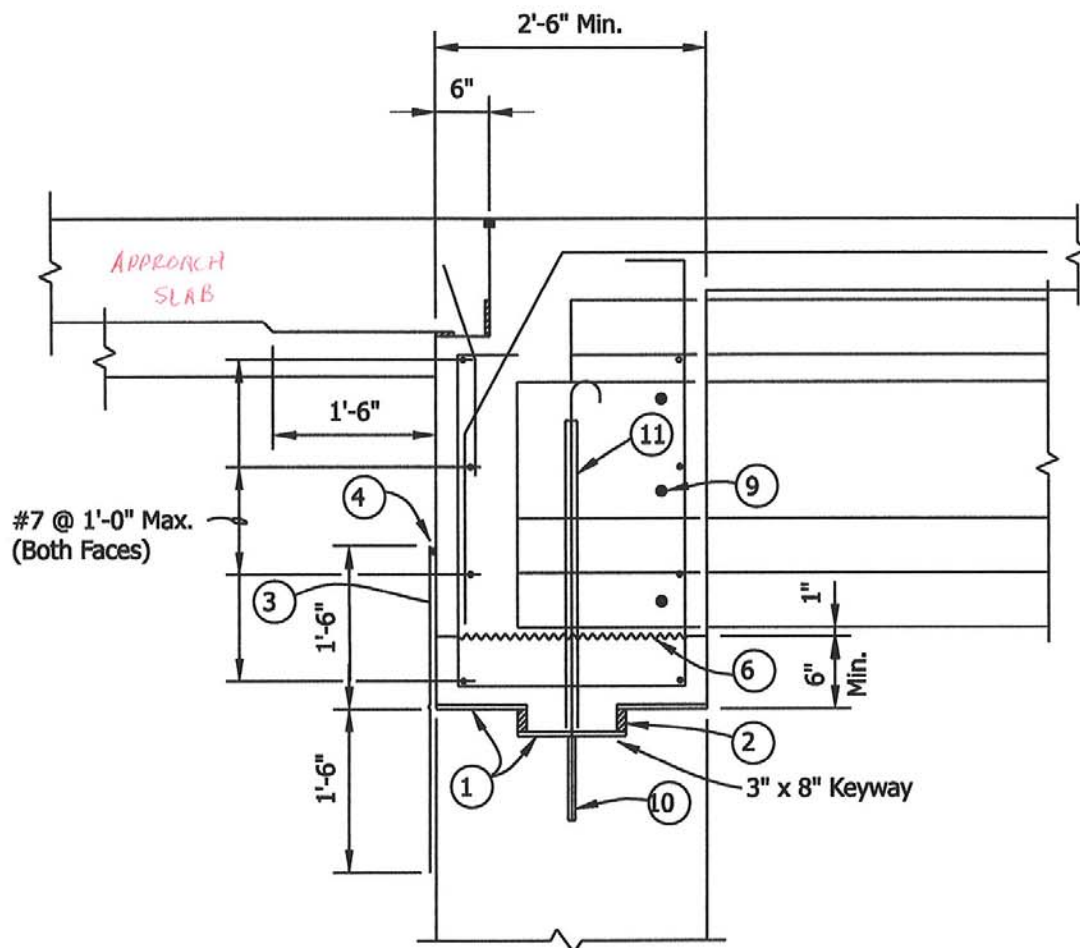
SECTION AT BEAM



NEOPRENE SHEETING DETAIL

SUGGESTED SEMI-INTEGRAL END BENT DETAILS (Method 1)

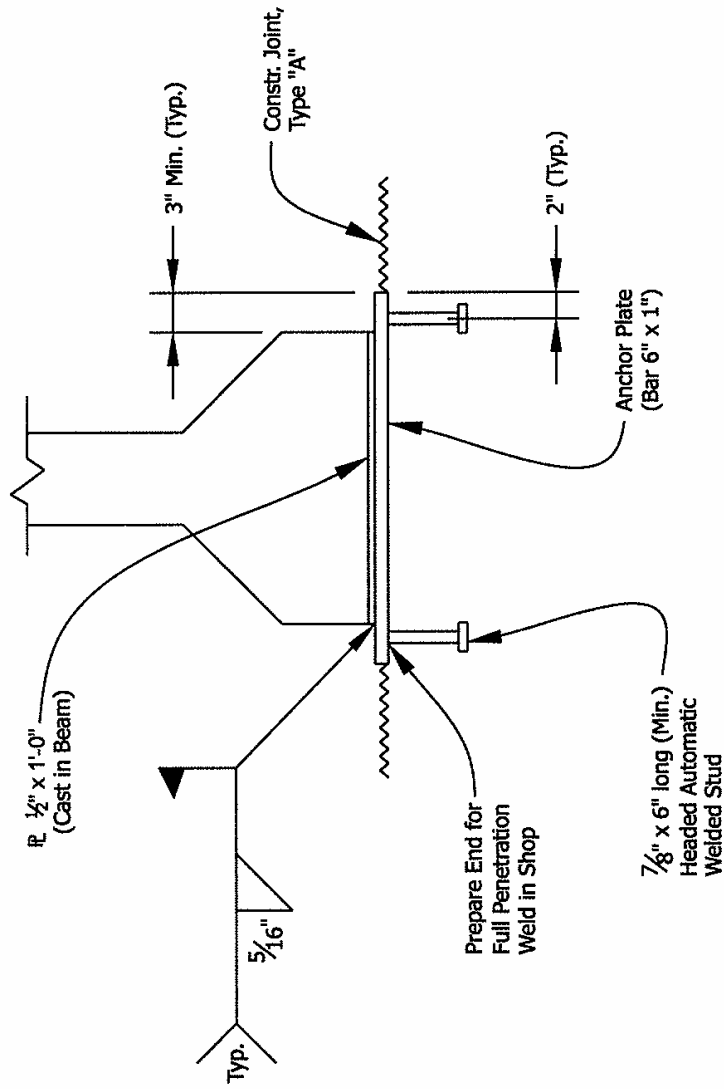
Figure 67-1 C (1)



SECTION BETWEEN BEAMS

SUGGESTED SEMI-INTEGRAL END BENT DETAILS (Method 1)

**Figure 67-1 C (1)
(Continued)**



ANCHOR PLATE DETAIL

SUGGESTED SEMI-INTEGRAL END BENT DETAILS (Method 1)

Figure 67-1 C (1)
 (Continued)

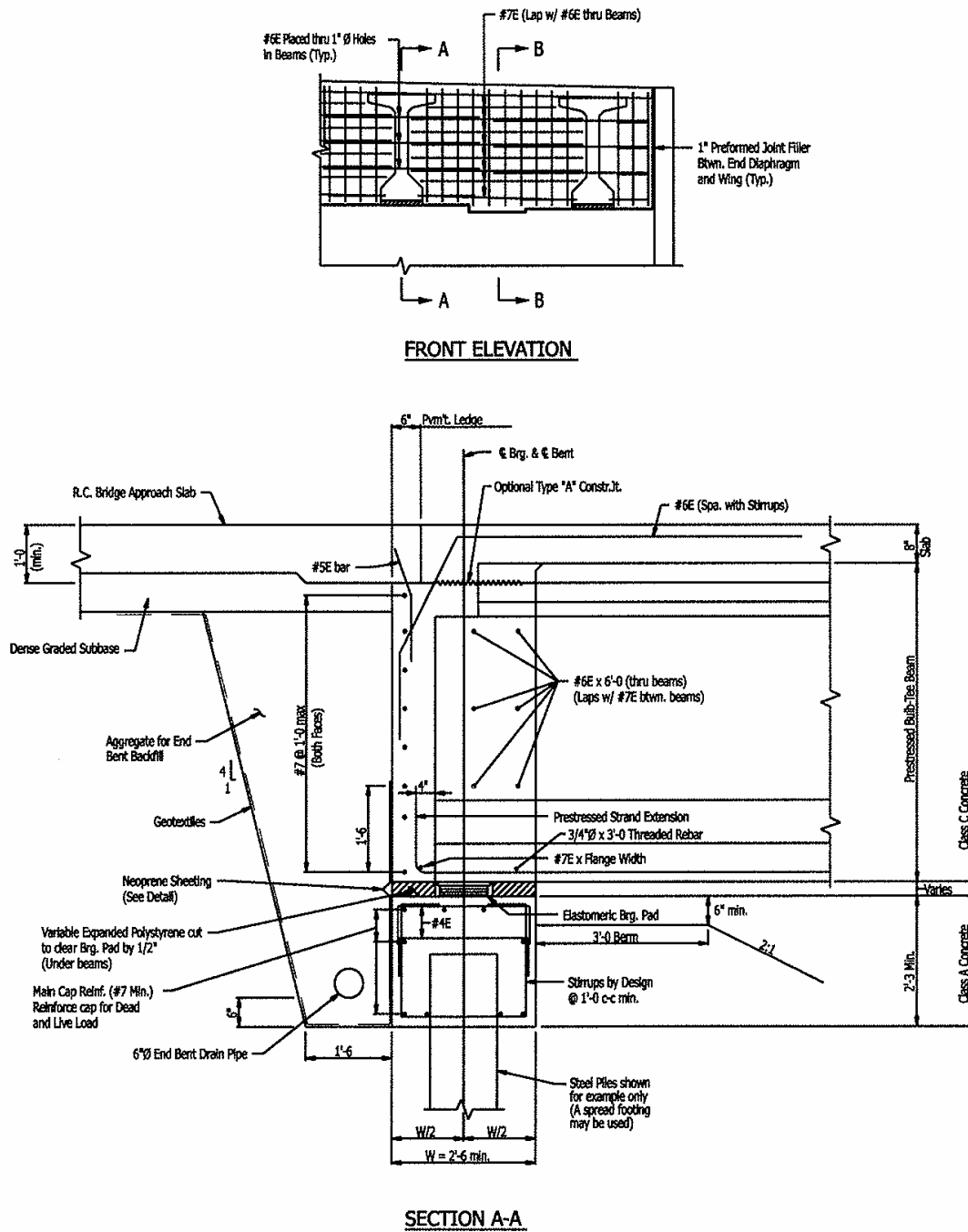
- ① 3 Layers of Medium Weight Roofing Felt w/Grease between layers over $\frac{1}{8}$ " High-Density Plastic Bearing Strip with smooth side up.
- ② Expanded Polystyrene (Designer to determine thickness)
- ③ Neoprene Sheeting attached to Concrete.
- ④ Continuous bead of Silicone Caulk under Neoprene Sheeting.
- ⑤ Anchor Plate (See Details)
- ⑥ ⊗ Construction Joint Type "A" (Optional)
- ⑦ 1" Thick Expanded Polystyrene, full width of Beam.
- ⑧ Plate $\frac{1}{2}$ " x 1'-0", full width of Beam.
(Cast in Beam)
- ⑨ #6 Reinforcing Bar thru 1"Ø Holes cast in Beam Web.
- ⑩ ⊗ ⊗ #6 Reinforcing Bar set in 1'-0" Deep Filed Drilled Hole filled with Epoxy Grout. (Min. Pullout = 26,500 Lbs.)
- ⑪ ⊗ ⊗ PVC Sleeve (Designer to determine size of Sleeve)
(Top of Sleeve to be sealed before Concrete is poured)

⊗ Constr. Joint may be used, between Wings, to facilitate temporary support of Beams. If Beams are temporarily supported by another approved method, the Constr. Joint may be eliminated.

⊗ ⊗ Used only if uplift is expected, or if bridge is in Seismic Zone 2.

SUGGESTED SEMI-INTEGRAL END BENT DETAILS (Method 1)

Figure 67-1 C (1)
(Continued)



**SUGGESTED SEMI-INTEGRAL END BENT DETAILS
(Method 2)**

Figure 67-1 C (2)

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 702, AFTER LINE 43, INSERT AS FOLLOWS:

High Density Plastic Bearing Strips906.08
Neoprene Sheeting906.02(a)5

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision Frequency Manual Update Required? Y___ N___ By - Addition or Revision
None	
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
	None
Motion: M	Action: Passed as submitted; revised
Second: M	Effective: _____ Letting
Ayes:	_____ 2008 Standards Specifications Book
Nays:	_____ 2008 Standards Edition
	Withdrawn _____
	Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 702, AFTER LINE 1270, INSERT AS FOLLOWS:

Where semi-integral end bents are constructed, a neoprene sheet with nylon fabric reinforcement shall be installed as shown on the plans. The neoprene shall be secured to the concrete with approved pneumatically placed fastening devices which will not damage the neoprene or the concrete. The neoprene sheet shall be centered on the joints. Laps shall not be incorporated into the vertically installed neoprene sheeting.

Other sections containing
specific cross references:

203.19 Pg 200-32
714.03 Pg 700-103

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

None

Standard Sheets potentially affected:

None

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
_____ 2008 Standards Specifications Book
_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 702, AFTER LINE 1374, INSERT AS FOLLOWS:

Neoprene sheeting and all materials required for installation of the sheeting will not be measured.

High density plastic bearing strips will not be measured.

Other sections containing
specific cross references:

704.07 Pg 700-53
714.07 Pg 700-104
717.08 Pg 700-124

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

None

Standard Sheets potentially affected:

None

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
_____ 2008 Standards Specifications Book
_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 702, AFTER LINE 1454, INSERT AS FOLLOWS:

The cost of furnishing and installing neoprene sheeting shall be included in the cost of concrete, class A.

The cost of high density plastic bearing strips shall be included in the cost of concrete, class A.

Other sections containing
specific cross references:

206.11 Pg 200-58
704.08 Pg 700-53
714.08 Pg 700-104

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

Standard Sheets potentially affected:

None

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
_____ 2008 Standards Specifications Book
_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 714, AFTER LINE 37, INSERT AS FOLLOWS:

714.03.1 Backfill

Structure backfill or flowable backfill shall be used as backfill around concrete culverts. Backfill shall be placed in accordance with 211 or 213 as applicable.

SECTION 714, BEGIN LINE 86, INSERT AS FOLLOWS:

714.07 Method of Measurement

Concrete used in retaining walls, culverts, and culvert extensions will be measured in accordance with 702.27. Reinforcing steel will be measured in accordance with 703.07. Precast reinforced concrete box sections and precast reinforced concrete box section extensions will be measured by the linear foot (meter), complete in place. *Common excavation for retaining walls will be measured by the cubic yard (cubic meter) to the neat lines shown on the plans.* Structure backfill and B borrow for retaining walls will be measured in accordance with 211.09 to the neat lines shown on the plans. *Structure backfill for drainage structures will be measured in accordance with 211.09.* Flowable backfill will be measured in accordance with 213.08. Field drilled holes will be measured in accordance with 702.27.

714.08 Basis of Payment

The accepted quantities of concrete used in retaining walls, culverts, and culvert extensions will be paid for at the contract unit price per cubic yard (cubic meter) for concrete, of the class specified, structures. Reinforcing steel will be paid for in accordance with 703.08. Precast reinforced concrete box sections will be paid for at the contract unit price per linear foot (meter) for culvert, precast reinforced concrete box sections, of the size specified, complete in place. Precast reinforced concrete box section extensions will be paid for at the contract unit price per linear foot (meter) for culvert extension, precast reinforced concrete box sections, of the size specified, complete in place. *Common excavation for retaining walls will be paid for at the contract unit price per cubic yard (cubic meter) to the neat lines shown on the plans in accordance with 203.28.* Structure backfill and B borrow for retaining walls will be paid for in accordance with 211.10 to the neat lines shown on the plans. *Structure backfill for drainage structures will be paid for in accordance with 211.10.* Flowable backfill will be paid for in accordance with 213.09. Field drilled holes will be paid for in accordance with 702.28.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 714 CONTINUED.

Other sections containing
specific cross references:

None

Recurring Special Provisions
potentially affected:

714-R-437
717-R-152
723-R-228
723-R-228f

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Standard Sheets potentially affected:

715-BKFL-01 thru 12

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn

Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 715, AFTER LINE 27, INSERT AS FOLLOWS:

Concrete	702
Flowable Backfill	213
Geotextiles	918.03
Reinforcing Steel	910.01
Rubber Type Gaskets	906.04
Straps, Hook Bolts, and Nuts	908.12
Structure Backfill	904

The maximum particle size of backfill material for corrugated pipe shall be less than one-half the corrugation depth.

SECTION 715, BEGIN LINE 287, DELETE AND INSERT AS FOLLOWS:

715.09 Backfilling

~~All plastic pipes, except longitudinal underdrains, which are not fabricated with hydrostatic design basis rated resins and are installed within 5 ft (1.5 m) of mainline or public road approach pavement, paved shoulders, or sidewalks shall be backfilled with structure backfill or flowable backfill. Structure backfill shall be placed in accordance with 211. Flowable backfill shall be placed in accordance with 213.07. All other pipe installations shall be backfilled as shown on the plans or as directed. Structure backfill shall be placed in accordance with 211.04.~~

Prior to placing flowable backfill, all standing water shall be removed from the trench. If the water cannot be removed from the trench, structure backfill shall be used in lieu of flowable backfill to an elevation 2 ft (0.6 m) above the groundwater. The remainder of the trench shall be backfilled as shown on the plans.

~~Except where prohibited due to groundwater, flowable backfill may be used as a substitute for structure backfill.~~

~~After the completion of the backfill operation and prior to beginning the paving operation, all plastic pipes, except longitudinal underdrains, not fabricated with hydrostatic design basis rated resins installed within 5 ft (1.5 m) of mainline or public road approach pavement, paved shoulders, or sidewalks~~ *Except for underdrains, all polyethylene and polyvinyl chloride pipes 36 in. (900 mm) or less in pipe pay item diameter shall be mandrel tested a minimum of 30 days after the completion of backfill operations, or as otherwise directed. The mandrel shall be a go/no go mandrel with a minimum of nine arms or prongs and a diameter of 5% less than the pipe pay item diameter. If the mandrel does not pass through the pipe when pulled by hand or the mandrel damages the pipe, the deficient pipe shall be removed, replaced, and mandrel tested a minimum of 30 days after the flowable backfill has been replaced or as otherwise directed. Pipes having a pipe pay item diameter greater than 36 in. (900 mm) will be visually inspected for acceptance. Pipes that cannot be visually inspected shall be video inspected in accordance with 718.07. The Engineer will determine the sections of pipe to be video inspected. Video inspection shall be conducted a minimum of 30 working days after the completion of the backfill operations or as otherwise directed. Commercial and private drive pipes are excluded from the mandrel testing and video inspection requirements.*

Where material other than structure backfill or flowable backfill is permitted and used for backfilling, it shall be of such nature that compacts readily. That portion around and for 6 in. (150 mm) above the top of the pipe shall be free from large stones. This material shall be placed in layers not to exceed 6 in. (150 mm), loose measurement, and each layer compacted thoroughly by means of mechanical tamps. *Where coarse aggregate No. 8, No. 9, or No. 11 is used for structure backfill, geotextile shall be installed as shown on the plans.*

An adequate earth cover, as shown on the plans, shall be placed over the structure before heavy equipment is ~~driven~~ operated over it.

Backfill for slotted drain pipe and slotted vane drain pipe shall consist of class A concrete on both sides of the pipe. During the backfilling and paving operations, the slot shall be covered to prevent infiltration of material into the pipe.

SECTION 715, BEGIN LINE 408, INSERT AS FOLLOWS:

Structure backfill will be measured in accordance with 211.09. Flowable backfill will be measured in accordance with 213.08.

Pavement replacement and subbase necessary due to structure replacement under an existing pavement will be measured to the neat lines shown on the plans.

For structures for which the plans permit pipes of differing sizes for either smooth or corrugated interiors, and the corrugated interior alternate is installed, measurement of ~~B-borrow for~~ structure backfill or flowable ~~mortar~~ backfill will be based on the neat line dimensions shown on the plans for the smooth interior alternate.

Grated box end sections will be measured per each for the specified type, surface slope, and pipe size.

Video inspection for pipe will be measured by the linear foot (meter) as determined by the electronic equipment.

Geotextile used to wrap backfill material will not be measured.

SECTION 715, AFTER LINE 439, INSERT AS FOLLOWS:

Structure backfill will be paid for in accordance with 211.10. If utilized as a substitute for structure backfill, flowable backfill will be paid for as structure backfill. Otherwise, flowable backfill will be paid for in accordance with 213.09.

SECTION 715, AFTER LINE 461, INSERT AS FOLLOWS:

Video inspections for pipe will be paid for at the contract unit price per linear foot (meter) completed.

SECTION 715, AFTER LINE 562, INSERT AS FOLLOWS:

Video Inspection for Pipe..... LFT (m)

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 715, AFTER LINE 592, INSERT AS FOLLOWS:

Geotextile required for coarse aggregate No. 8, No. 9, or No. 11 structure backfill material will not be paid for separately. The cost of the geotextile shall be included in the cost of structure backfill.

The cost of providing the video inspection equipment, technician, videotapes, or computer disks shall be included in the cost of the video inspection for pipe. No additional payment will be made for repair or removal of pipes, backfill, the video re-inspection of the repairs or replaced pipe, and all other work associated with the repair or removal or unaccepted pipes.

Other Section Containing specific cross references

205.02, Pg. 200-49
205.06, Pg. 200-51
205.07, Pg. 200-52
717.02, Pg. 700-121
717.08, Pg. 700-124
717.09, Pg 700-124
718.09, Pg 700-127
718.10, Pg 700-127
719.02, Pg 700-129
719.04, Pg 700-130
719.05, Pg 700-130
719.07, Pg 700-130
719.08, Pg 700-130

Other sections containing
specific cross references:

See Above

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

714-R-437
717-R-152
723-R-282
723-R-282f

Standard Sheets potentially affected:

211-BFIL-01 thru 05
714-BCEX-01 and 02
715-BKFL-01 thru 12

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn

Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 717, BEGIN LINE 3, DELETE AND INSERT AS FOLLOWS:

717.01 Description

This work shall consist of furnishing and placing structural plate pipe, pipe-arches, or arches in accordance with ~~these specifications and in reasonably close conformance with the lines, grades, and details shown on the plans or as directed~~ 105.03.

SECTION 717, BEGIN LINE 81, DELETE AND INSERT AS FOLLOWS:

717.04 Backfill

~~Where shown on the plans or when directed, All structural plate pipe and pipe arches shall be backfilled with structure backfill or flowable backfill, shall be used in backfilling around pipe and pipe arch structures or as otherwise directed. Arch structure backfill shall be structure backfill. The amount of camber on the invert of the pipe or pipe-arch shall be varied to suit the height of fill and supporting soil, except the camber grade shall not be above level. The finished backfill grade shall be as shown on the plans. Structure backfill shall be placed in accordance with 211. Flowable backfill shall be placed in accordance with 213.~~

~~After the pipe or pipe arch has been assembled and is in place, backfill material shall be placed in accordance with 211.04 or 213.07.~~

An adequate earth cover shall be provided over the structure, as shown on the plans, before heavy construction equipment is ~~driven~~ operated over it. This earth cover shall be free of stones.

~~When~~ Where backfilling at arches before headwalls are placed, the material shall first be placed midway between the ends of the arch, forming as narrow a ramp as possible, until the top of the arch is reached. The ramp shall be built up evenly on both sides and the backfilling material compacted as it is placed. After both ramps have been built to the top of the arch, the remainder of the backfill shall be deposited in both directions from the center to the ends and evenly on both sides of the arch.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 717 CONTINUED.

Other sections containing
specific cross references:

None

Recurring Special Provisions
potentially affected:

714-R-437
717-R-152
723-R-282
723-R-282f

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Standard Sheets potentially affected:

211-BFIL-01 thru 05
714-BCEX-01 and 02
715-BKFL-01 thru 12

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn

Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 904, BEGIN LINE 360, DELETE AND INSERT AS FOLLOWS:

904.05 Structure Backfill

The material shall be of acceptable quality, free from large or frozen lumps, wood, or other extraneous matter. It shall consist of suitable sand, gravel, crushed stone, ACBF, or GBF. ~~Coarse aggregate used for backfilling end bents on beam structures shall be No. 8 or No. 9 crushed stone or BF slag, class D or higher, in accordance with 904.~~ Structure backfill shall be in accordance with one of the following gradations *or No. 8, No. 9, No. 11, No. 53, or No. 73 coarse aggregate in accordance with the gradation requirements of 904.03(e). Coarse aggregate No. 8, No. 9, No. 11, No. 53, or No. 73 shall be crushed stone or ACBF, class D or higher.*

Other sections containing
specific cross references:

204.02, Pg 200-44, 211.02, Pg 200-70
714.02, Pg 700-102, 715.02, Pg 700-106
717.02, Pg 700-121, 718.02, Pg 700-125
719.02. Pg 700-129

Recurring Special Provisions
potentially affected:

714-R-437
717-R-152
723-R-282
723-R-282f

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Standard Sheets potentially affected:

211-BFIL-01 thru 05
714-BCEX-01 and 02
715-BKFL-01 thru 12

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn

Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 906, AFTER LINE 97, INSERT AS FOLLOWS:

5. Neoprene Sheeting

Neoprene sheeting shall be general purpose, heavy duty with nylon fabric reinforcement. The neoprene sheeting shall be in accordance with the test requirements as follows:

<i>Test Description</i>	<i>ASTM Method</i>	<i>Requirement</i>
<i>Thickness</i>	<i>D 751</i>	<i>0.10 in. \pm 0.01 in. (25 mm \pm 0.3 mm)</i>
<i>Minimum Breaking Strength, Grab, W x F</i>	<i>D 751</i>	<i>700 lb x 700 lb (3120 N x 3120 N)</i>
<i>Minimum Adhesion, 1 in. wide Strip, 2 in. min. Pull</i>	<i>D 751</i>	<i>6 lb min. (27 N min.)</i>
<i>Minimum Burst Strength (Mullen)</i>	<i>D 751</i>	<i>1.40 ksi min. (9.65 MPa min.)</i>
<i>Heat Aging, 70 h, Temp. 212°F (100°C), 180 deg Bend, without cracking</i>	<i>D 2136</i>	<i>No Cracking of Coating</i>
<i>Low-Temperature Brittleness, 1 h at -40°F (-40°C), Bend Around 1/4 in. (6 mm) Mandrel</i>	<i>D 2136</i>	<i>No Cracking of Coating</i>

Other sections containing
specific cross references:

None

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

None

Standard Sheets potentially affected:

None

Motion: M

Second: M

Ayes:

Nays:

Action: Passed as submitted; revised

Effective: _____ Letting

_____ 2008 Standards Specifications Book

_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 906, AFTER LINE 255, INSERT AS FOLLOWS:

906.08 High Density Plastic Bearing Strips

The strip shall be of multipolymer plastic and shall have the physical properties as follows:

- (a) *Compressive strength shall be 8000 to 9000 psi (55.2 to 62.1 kPa).*
- (b) *The material shall be nontoxic.*
- (c) *The cold-flow characteristic at 1000 psi and 73°F (6.9 kPa and 22°C) shall be 1%.*
- (d) *The coefficient of linear expansion shall be 3.0×10^{-5} in./in./°C to 5.0×10^{-5} in./in./°C (7.62×10^{-4} mm/mm/°C to 1.27×10^{-3} mm/mm/°C).*

Other sections containing
specific cross references:

None

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

None

Standard Sheets potentially affected:

None

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
_____ 2008 Standards Specifications Book
_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____

Item No. 17-1
Ms. Rearick
Date: 11/16/06

REVISION TO STANDARD DRAWINGS

205-TECD-02 Temporary Check Dam, Straw Bales

Other sections containing
specific cross references:

None

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

Standard Sheets potentially affected:

See Above

Motion: M

Second: M

Ayes:

Nays:

Action: Passed as submitted; revised

Effective: _____ Letting

_____ 2008 Standards Specifications Book

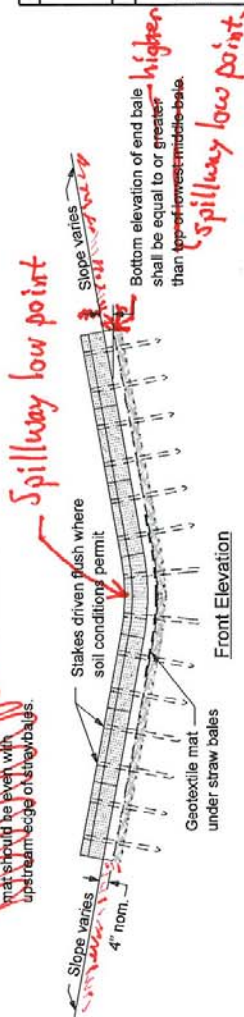
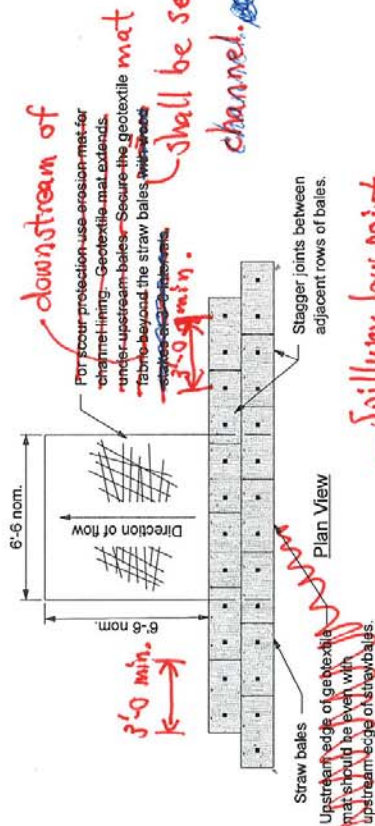
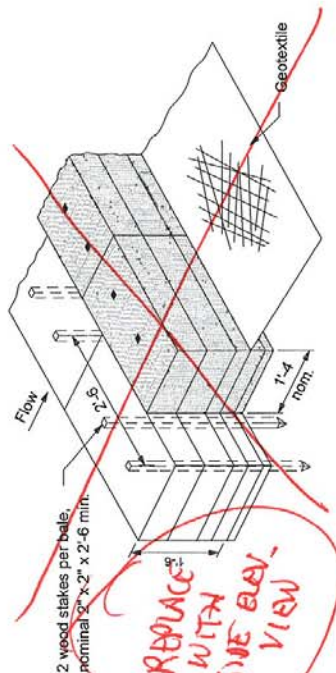
_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____

GENERAL NOTES

1. Ditch checks shall be spaced such that the top of the downstream check is at the same elevation as the toe of the adjacent upstream check ~~dam~~.



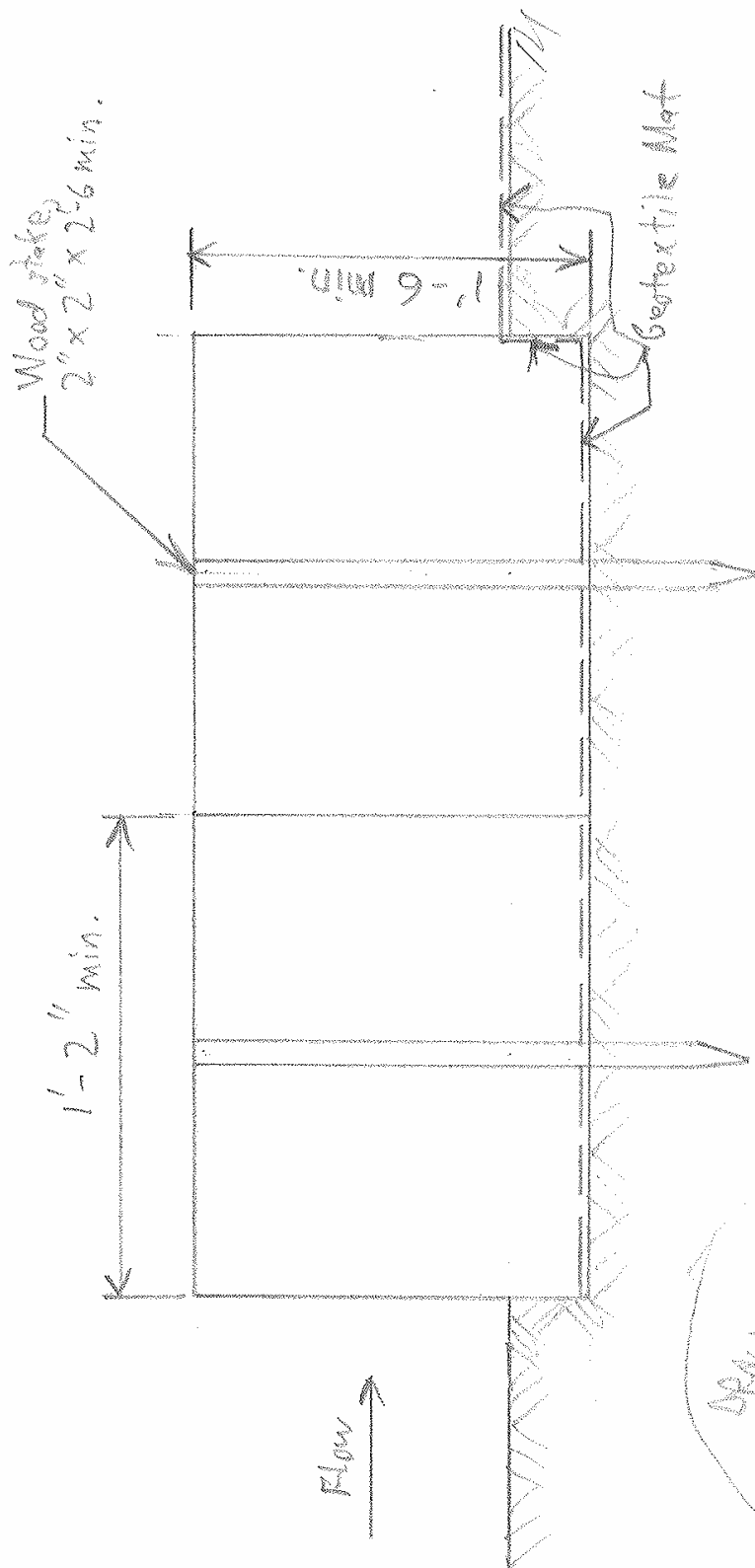
INDIANA DEPARTMENT OF TRANSPORTATION

TEMPORARY CHECK DAM, STRAW BALES

MARCH 2005

STANDARD DRAWING NO. E 205-TECD-02

DESIGNED BY	9750	DATE	3-20-05
CHECKED BY		DATE	
DESIGN STANDARD ENGINEER		DATE	
IN CHARGE		DATE	
DESIGN STANDARD ENGINEER		DATE	



Side Elevation

DRAW BAILEY
SUCH THAT
 $1'-2''$ DIMEN.
APPROX. SHOWER
THAN $1'-6''$ DIMEN.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 205, BEGIN LINE 20, DELETE FOLLOWS:

Straw bales shall ~~be a minimum of 14 in. by 18 in. by 36 in. (350 mm by 450 mm by 900 mm)~~ and shall not weigh less than 35 lb (16 kg). Bales shall be bound with wire or nylon twine.

Other sections containing
specific cross references:

None

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

Standard Sheets potentially affected:

Motion: M
Second: M
Ayes:
Nays:

Action: Passed as submitted; revised
Effective: _____ Letting
_____ 2008 Standards Specifications Book
_____ 2008 Standards Edition

Withdrawn _____

Received FHWA Approval? _____

Item No. 17-3
Mr. Heustis
Date: 11/16/06

REVISION TO STANDARD DRAWINGS

715-BKFL-01, Pipe Backfill Method 1, New Roadway, Trench
715-BKFL-02, Pipe Backfill Method 1, New Roadway, Embankment
715-BKFL-03, Pipe Backfill Method 1, Existing Roadway, Trench, HMA Pavement
715-BKFL-04, Pipe Backfill Method 1, Existing Roadway, Trench, PCC Pavement
715-BKFL-05, Pipe Backfill Method 1, Existing Roadway, Trench, Composite Pvmt.
715-BKFL-06, Pipe Backfill Method 2, Commercial & Private Drives, Trench
715-BKFL-07, Pipe Backfill Method 2, Commercial & Private Drives, Embankment
715-BKFL-08, Pipe Backfill Method 3, Median Installation, Trench
715-BKFL-09, Pipe Backfill Method 3, Median Installation, Embankment
715-BKFL-10, Pipe Backfill Limit Determination

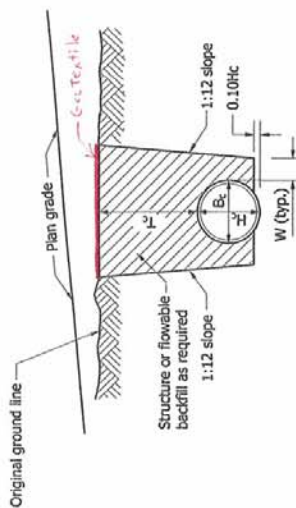
The above proposed standards are to replace the following existing standards
715-BKFL-01 thru 12.

Other sections containing specific cross references:	General Instructions to Field Employees Update Required? Y___ N___ By - Addition or Revision
None	Frequency Manual Update Required? Y___ N___ By - Addition or Revision
Recurring Special Provisions potentially affected:	Standard Sheets potentially affected:
	See Above
Motion: M	Action: Passed as submitted; revised
Second: M	Effective: _____ Letting
Ayes:	_____ 2008 Standards Specifications Book
Nays:	_____ 2008 Standards Edition
	Withdrawn _____
	Received FHWA Approval? _____

NOTES:

- Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - 1.5' for $B_c \leq 18"$
 - 3' for $18" < B_c \leq 54"$
 - 4' for $B_c > 54"$
- For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing E 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
- Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 2 ft. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 2 ft encasement.

4. Geotextile required if cover aggregate wash.



SECTION A-A

LEGEND

- H_c = Overall diameter or rise (typ.)
- B_c = Overall diameter or span
- A = 8" min. for fill height less than 16'
- = 12" min. for fill height of 16' or more
- T_c = Trench cover depth over pipe
- W = 0.3 B_c or 9", whichever is greater
- E = Encasement
- L_e = Backfill length measured from toe to toe of the 2:1 slopes.

SECTION A-A
ROCK FOUNDATION

INDIANA DEPARTMENT OF TRANSPORTATION
PIPE BACKFILL METHOD 1
NEW ROADWAY, TRENCH

SEPTEMBER 2007

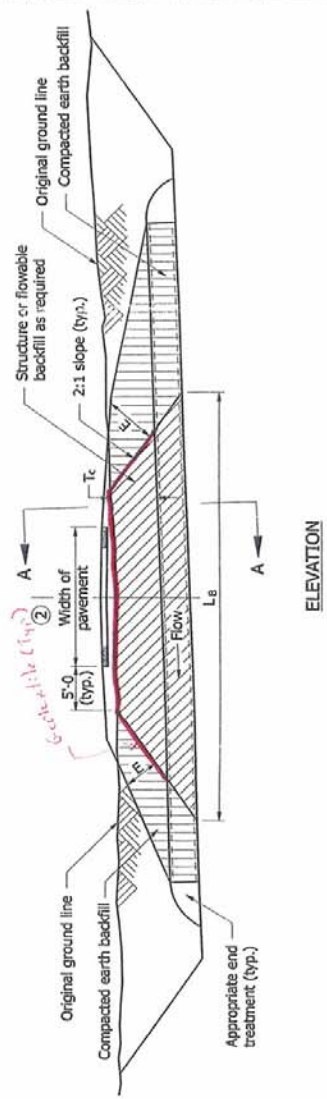
STANDARD DRAWING NO. E 715-BKFL-01



/s/ XXXXXXXXXX 01/01/06
DESIGN STANDARDS ENGINEER DATE

/s/ XXXXXXXXXX 01/01/06
CHIEF HIGHWAY ENGINEER DATE

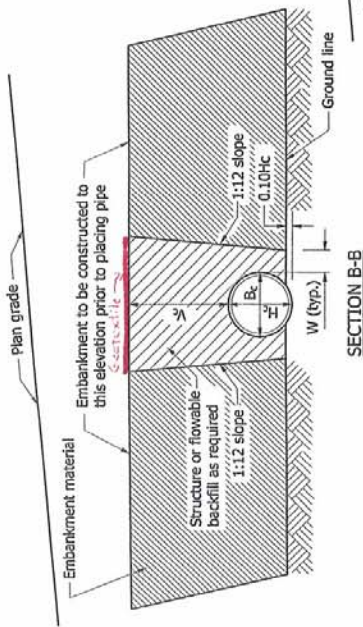
DESIGN STANDARDS ENGINEER



NOTES:

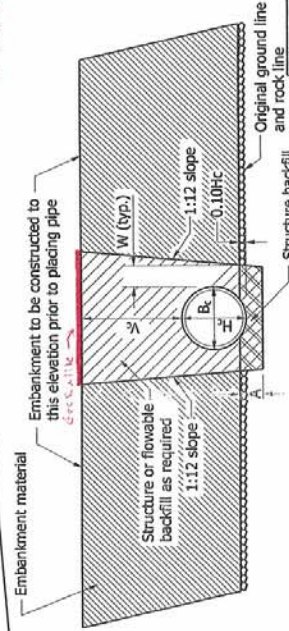
- Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - 1.5' for $B_c \leq 18"$
 - 3' for $18" < B_c \leq 54"$
 - 4' for $B_c > 54"$
- For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing E 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
- Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 2 ft. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 2 ft encasement.

4. Gentle slope required if coarse aggregate used.

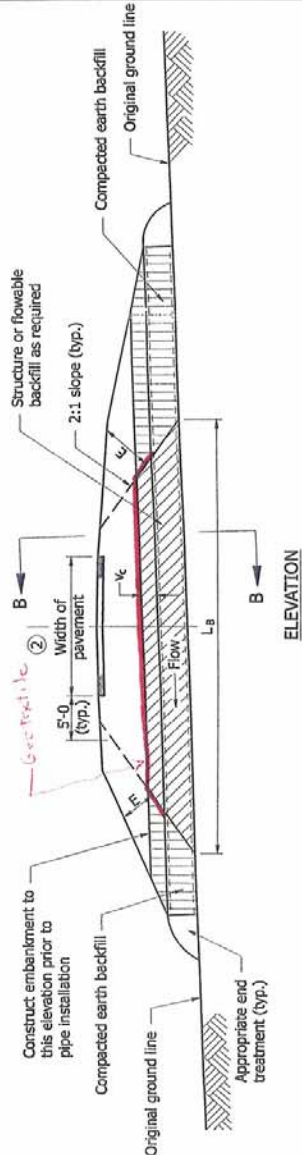


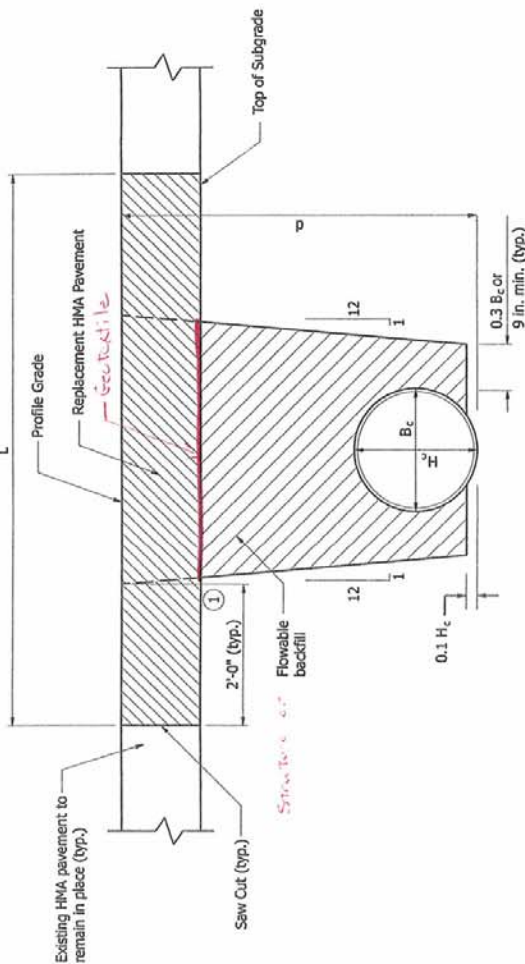
LEGEND

- H_c = Overall diameter or rise (typ.)
- B_c = Overall diameter or span
- A = 8" min. for fill height less than 16'
- A = 12" min. for fill height of 16' or more
- V_c = 12" for $B_c \leq 18"$
- V_c = 18" for $B_c > 18"$
- W = $0.3 B_c$ or 9", whichever is greater
- E = Encasement
- L_s = Backfill length measured from toe to toe of the 2:1 slopes.



SECTION B-B ROCK FOUNDATION





NOTES:

1. Existing subgrade over this longitudinal distance shall remain in place.
2. The minimum pavement sections shall be as follows:
HMA: 165 #/yd³ HMA Surface, Type A, B, C, or D on
275 #/yd³ HMA Intermediate, Type A, B, C, or D on
variable HMA Base, Type A, B, C, or D.
3. If underdrains are present, they shall be perpetuated in accordance with the details shown on Standard Drawing E 718-UNDR-01.
4. See Standard Drawing E 715-BKFL-01 for pipe backfill trench elevation view.

5. Geotextile required if coarse aggregate used.

- L = Longitudinal pay limits of pavement removal and pavement replacement (ft)
 B_c = Overall diameter or span (in.)
 H_c = Overall diameter or rise (in.)
 d = Vertical distance from flowline to profile grade (ft)

INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 1
EXISTING ROADWAY, TRENCH

SEPTEMBER 2007

STANDARD DRAWING NO. E 715-BKFL-03

HMA REPLACEMENT PAVEMENT



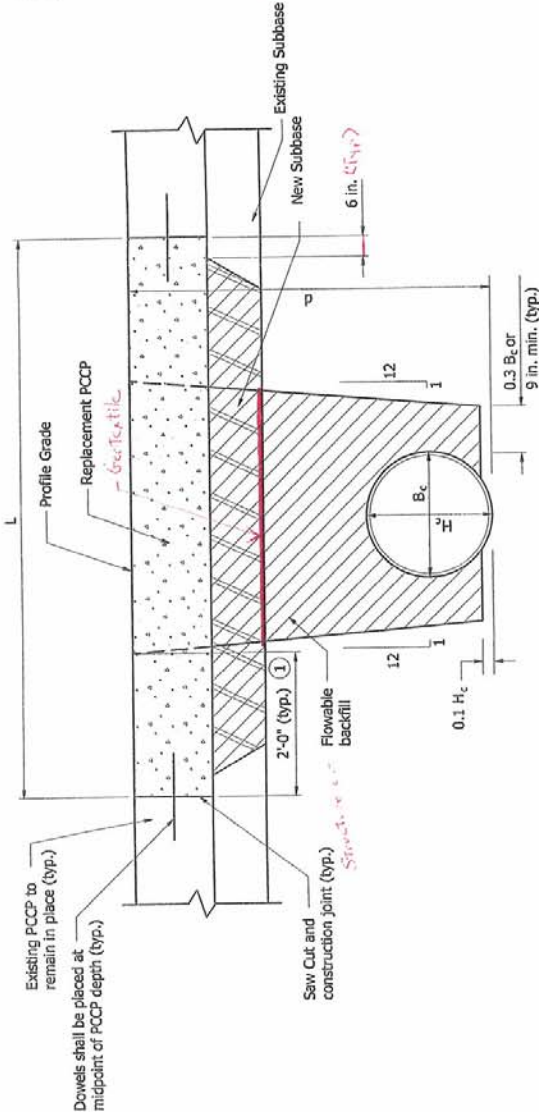
DESIGN STANDARDS ENGINEER
DATE 01/01/06
CHIEF HIGHWAY ENGINEER
DATE 01/01/06

DESIGN STANDARDS ENGINEER

NOTES:

- Existing subgrade over this longitudinal distance shall remain in place.
- The thickness of the replacement PCP shall match that of the existing concrete pavement.
- See Standard Drawing E 506-CCPP-01 for subbase, dowels, and construction joint details.
- If underdrains are present, they shall be perpetuated in accordance with the details shown on Standard Drawing E 718-UNDR-01.
- See Standard Drawing E 715-BKFL-01 for pipe backfill trench elevation view.

Geotextile required if concrete aggregate is used.



- L = Longitudinal pay limits of pavement removal and pavement replacement (ft)
 B_c = Overall diameter or span (in.)
 H_c = Overall diameter or rise (in.)
 d = Vertical distance from flowline to profile grade (ft)

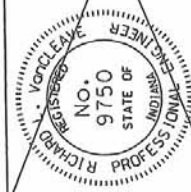
PCP REPLACEMENT PAVEMENT

...IT OF TRANSPORTATION

PIPE BACKFILL, METHOD 1
EXISTING ROADWAY, TRENCH

SEPTEMBER 2007

STANDARD DRAWING NO. E 715-BKFL-04



/s/ XXXXXXXX 01/01/06
DESIGN STANDARDS ENGINEER DATE

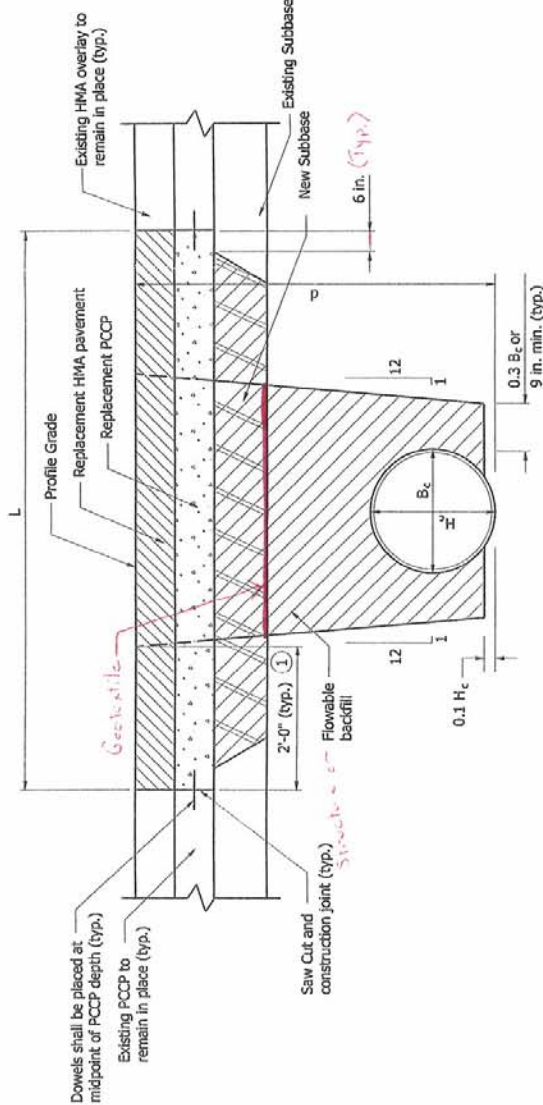
/s/ XXXXXXXX 01/01/06
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

NOTES:

- Existing subgrade over this longitudinal distance shall remain in place.
- The thickness of the replacement PCCP shall match that of the existing concrete pavement.
- The HMA pavement sections shall be as follows:
165 #/yd³ HMA Surface, Type A, B, C, or D on variable HMA Intermediate, Type A, B, C, or D on variable HMA Base, Type A, B, C, or D.
The lay rates of the Intermediate and Base courses shall match those for the existing courses.
- See Standard Drawing E 506-CPP-01 for subbase, dowels, and construction joint details.
- If underdrains are present, they shall be perpetuated in accordance with the details shown on Standard Drawing E 718-UNDR-01.
- See Standard Drawing E 715-BKFL-01 for pipe backfill trench elevation view.

7. Grout is required if concrete is to be used.



- L** = Longitudinal pay limits of pavement removal and pavement replacement (ft)
B_c = Overall diameter or span (in.)
H_c = Overall diameter or rise (in.)
d = Vertical distance from flowline to profile grade (ft)

COMPOSITE REPLACEMENT PAVEMENT

INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 1
EXISTING ROADWAY, TRENCH

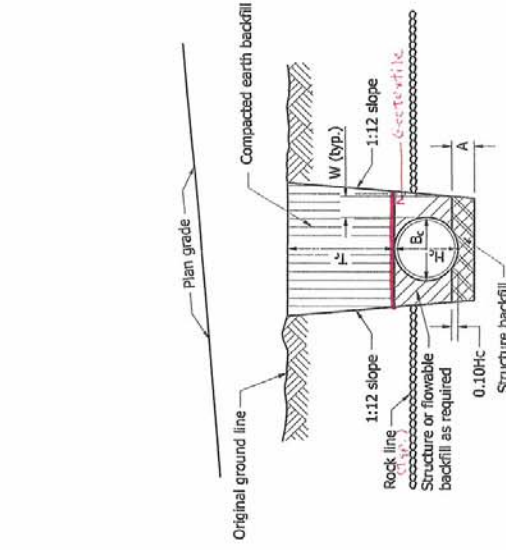
SEPTEMBER 2007

STANDARD DRAWING NO. E 715-BKFL-05

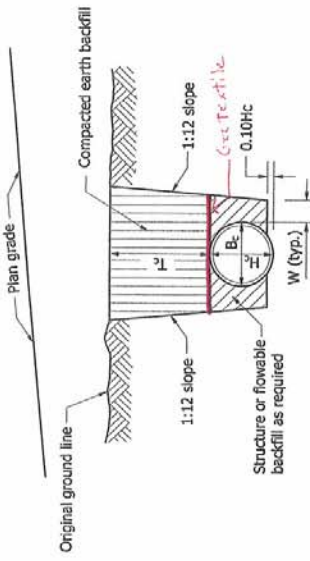
	DESIGN STANDARDS ENGINEER	DATE
	1/1/0000000000	01/01/06
	CHIEF HIGHWAY ENGINEER	DATE
	1/1/0000000000	01/01/06

- NOTES:**
- Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - 1.5' for $B_c \leq 18"$
 - 3' for $18" < B_c \leq 54"$
 - 4' for $B_c > 54"$
 - For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing E 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
 - Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 2 ft. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 2 ft encasement.

4. Gravel backfill required if using aggregate wood.



SECTION C-C
ROCK FOUNDATION



SECTION C-C

- LEGEND**
- H_c = Overall diameter or rise (typ.)
 - B_c = Overall diameter or span
 - A = 8" min. for fill height less than 16'
 - W = 12" min. for fill height of 16' or more
 - T_c = Trench cover depth over pipe
 - W = 0.3 B_c or 9", whichever is greater
 - E = Encasement
 - L_e = Backfill length measured from toe to toe of the 2:1 slopes.

INDIANA DEPARTMENT OF TRANSPORTATION

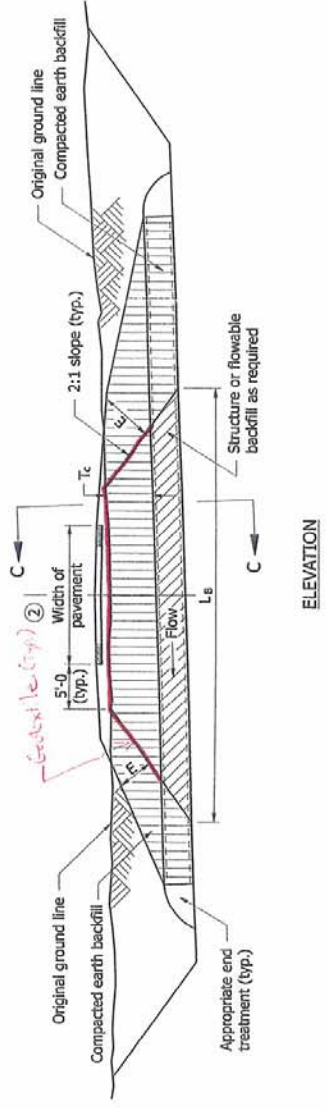
PIPE BACKFILL METHOD 2
NEW ROADWAY, TRENCH

COMMERCIAL & PRIVATE DRIVE

SEPTEMBER 2007

STANDARD DRAWING NO. E 715-BKFL-06

REGISTERED PROFESSIONAL ENGINEER NO. 9750 STATE OF INDIANA RICHARD J. KRAUSE	DESIGN STANDARDS ENGINEER	DATE
	CHIEF HIGHWAY ENGINEER	DATE
	<i>/s/XXXXXXXXXX</i>	01/01/06
	<i>/s/XXXXXXXXXX</i>	01/01/06

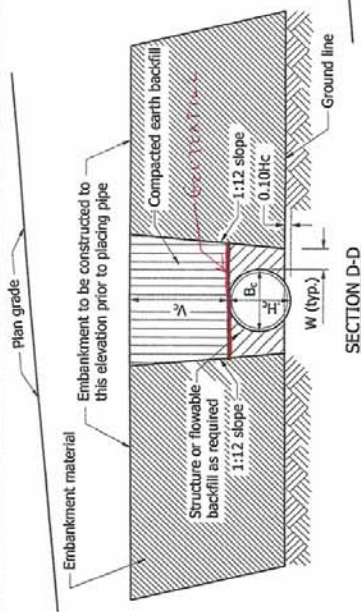


ELEVATION

NOTES:

- Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - 1.5' for $B_c \leq 18"$
 - 3' for $18" < B_c \leq 54"$
 - 4' for $B_c > 54"$
- For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing E 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.
- Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 2 ft. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 2 ft encasement.

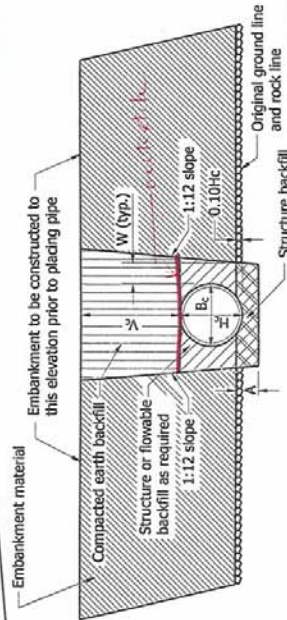
4. Geotextile required if coarse aggregate used.



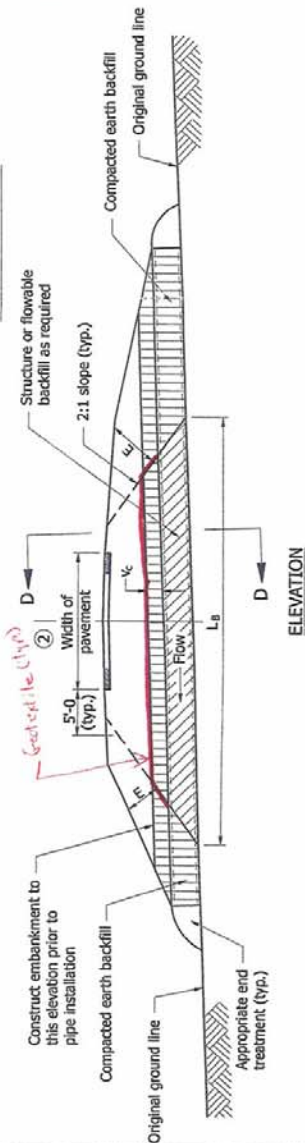
SECTION D-D

LEGEND

- H_c = Overall diameter or rise (typ.)
 B_c = Overall diameter or span
 A = 8" min. for fill height less than 16'
 A = 12" min. for fill height of 16' or more
 V_c = 12" for $B_c \leq 18"$
 V_c = 18" for $B_c > 18"$
 W = 0.3 B_c or 9", whichever is greater
 E = Encasement
 L_b = Backfill length measured from toe to toe of the 2:1 slopes.



**SECTION D-D
ROCK FOUNDATION**



INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 2

NEW ROADWAY, EMBANKMENT

COMMERCIAL & PRIVATE DRIVE

SEPTEMBER 2007

STANDARD DRAWING NO. E 715-BKFL-07



/s/ XXXXXXXX 01/01/06
DESIGN STANDARDS ENGINEER DATE

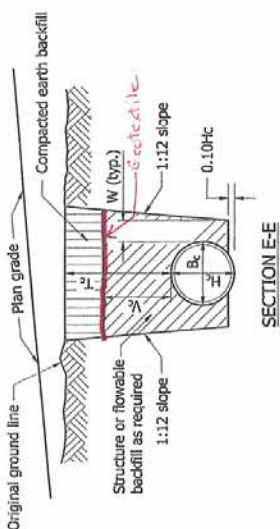
/s/ XXXXXXXX 01/01/06
CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER

NOTES:

- Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - 1.5' for $B_c \leq 18"$
 - 3' for $18" < B_c \leq 54"$
 - 4' for $B_c > 54"$
- For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing E 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.

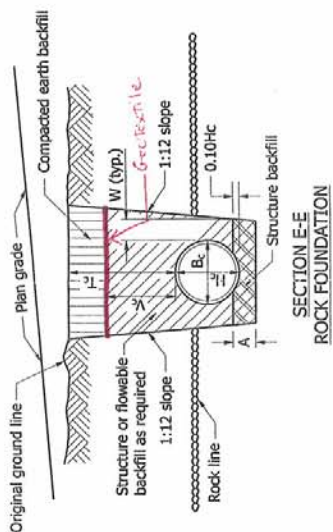
3. Geotextile required if coarse aggregate used.



LEGEND

- H_c = Overall diameter or rise (typ.)
- B_c = Overall diameter or span
- A = 8" min. for fill height less than 16'
- = 12" min. for fill height of 16' or more
- V_c = 12" for $B_c \leq 18"$
- = 18" for $B_c > 18"$
- T_c = Trench cover depth over pipe
- W = 0.3 B_c or 9", whichever is greater

L_s = Backfill length measured from toe to toe of the 2:1 slopes.

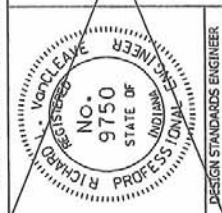


INDIANA DEPARTMENT OF TRANSPORTATION

PIPE BACKFILL METHOD 3
NEW ROADWAY, TRENCH
MEDIAN INSTALLATION

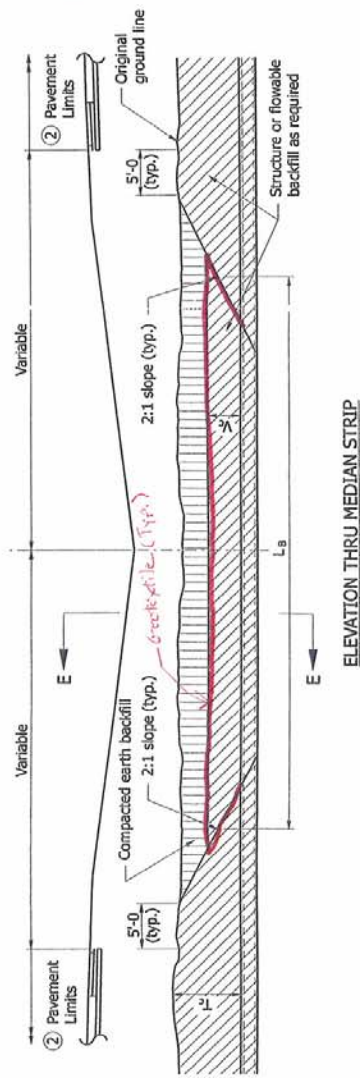
SEPTEMBER 2007

STANDARD DRAWING NO. E 715-BKFL-08



/s/ Richard L. Vent-Cleave
DESIGN STANDARDS ENGINEER
DATE 03/01/05

/s/ Richard K. Strutzner
CHIEF HIGHWAY ENGINEER
DATE 03/01/05



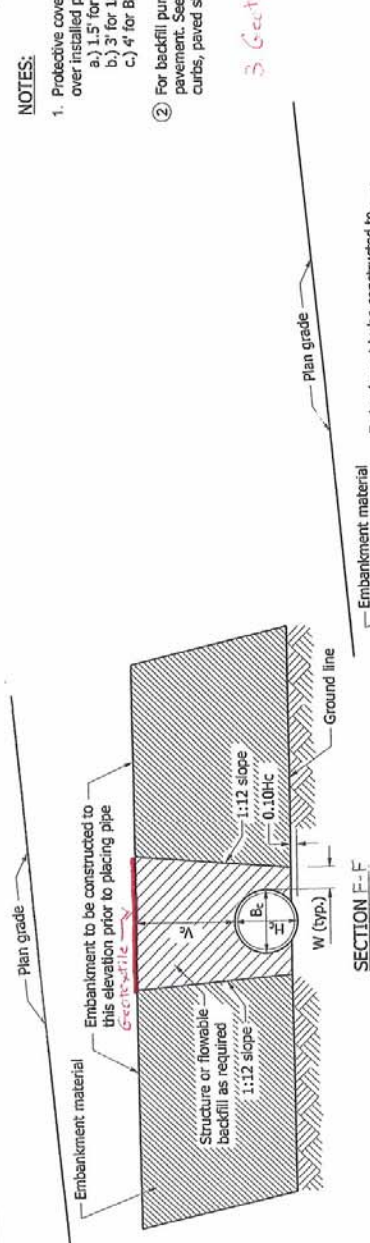
NOTES:

1. Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:

- a.) 1.5' for $B_c \leq 18"$
- b.) 3' for $18" < B_c \leq 54"$
- c.) 4' for $B_c > 54"$

② For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement. See Standard Drawing E 715-BKFL-10 for pavement limits when curbs, paved shoulders, or sidewalks are present.

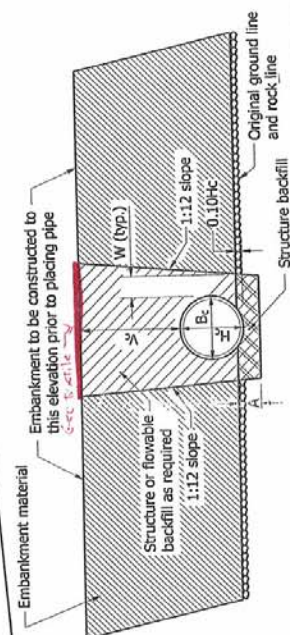
3. Geotextile required if cover is rejected.



SECTION F-F

LEGEND

- H_c = Overall diameter or rise (typ.)
- B_c = Overall diameter or span
- A = 8" min. for fill height less than 16'
- A = 12" min. for fill height of 16' or more
- W = 12" for $B_c \leq 18"$
- W = 18" for $B_c > 18"$
- W = 0.3 B_c or 9", whichever is greater
- E = Encasement
- L_3 = Backfill length measured from toe to toe of the 2:1 slopes.



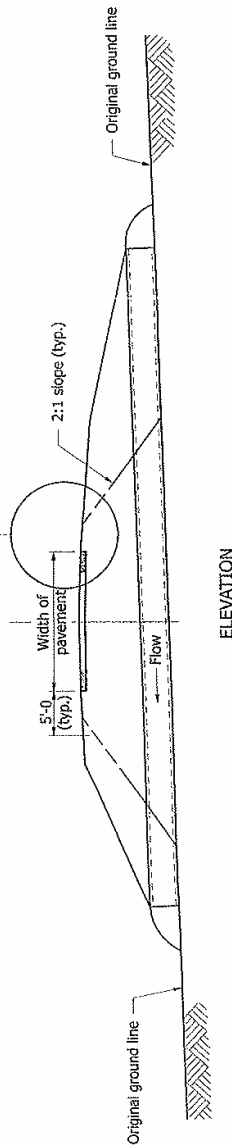
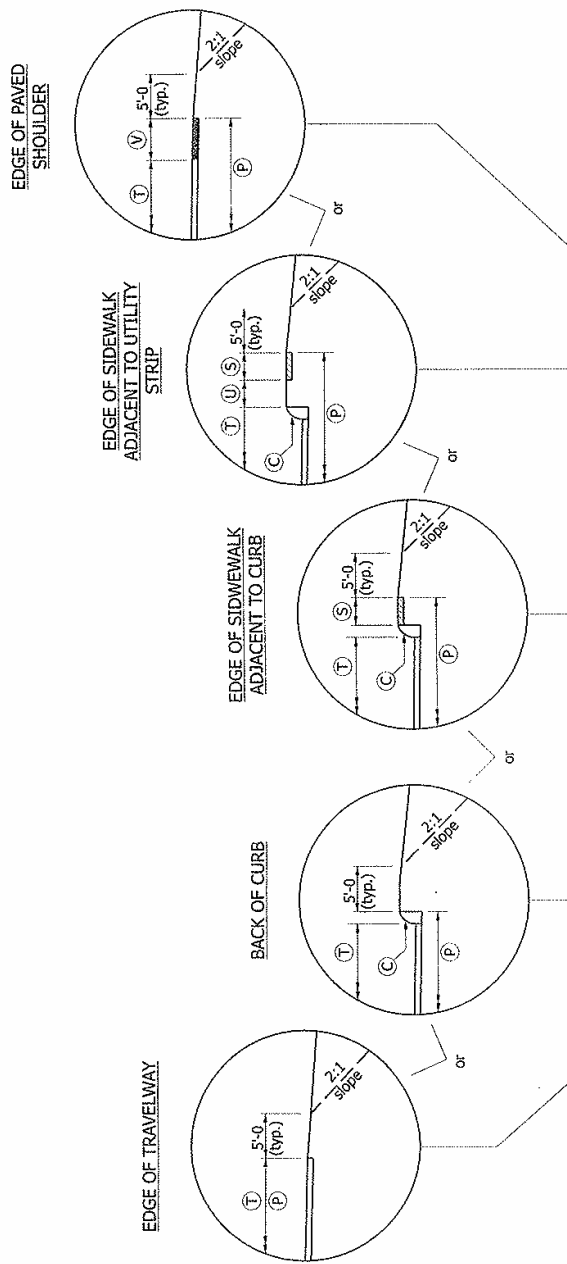
SECTION F-F



ELEVATION THRU MEDIAN STRIP

LEGEND

- C** Curb
- P** Pavement
- S** Sidewalk
- T** Travel Lane
- U** Utility Strip
- V** Paved Shoulder



INDIANA DEPARTMENT OF TRANSPORTATION

**PIPE BACKFILL
LIMIT DETERMINATION**

SEPTEMBER 2007

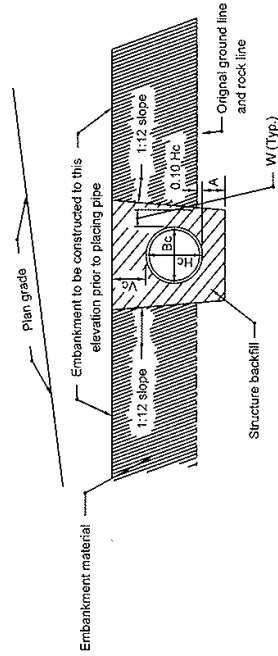
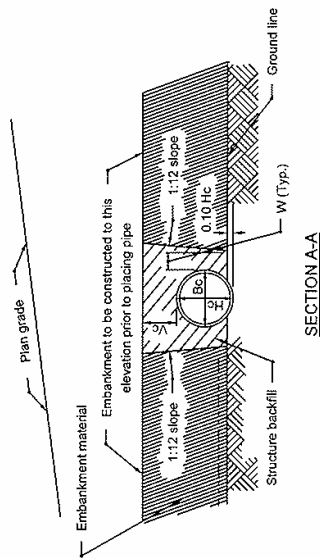
STANDARD DRAWING NO. E 715-BKFL-10

	DESIGN STANDARDS ENGINEER	DATE
	CHIEF HIGHWAY ENGINEER	DATE

The following sheets are the existing 715-BKFL-01 thru 12. They will be replaced by the previous sheets when approved. The existing sheets are being attached as information only.

NOTE

1. Refer to Standard Drawing E 715-BKFL-09 for general notes.

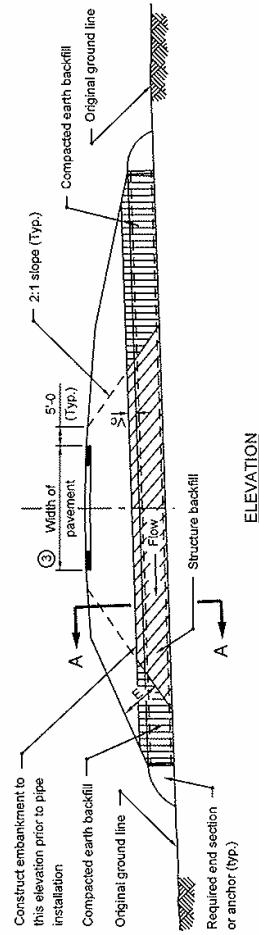


LEGEND

- Hc = Overall diameter or rise
- Bc = Overall diameter or span
- A = 8" min. for fill height up to 16"
- = 12" min. for fill height of 16' or more
- Vc = 12" for Bc 18" - 5'
- = 18" for Bc 18" > 5'
- W = 0.3 Bc or 9", whichever is greater
- E = Encasement

METHOD 1 BACKFILL

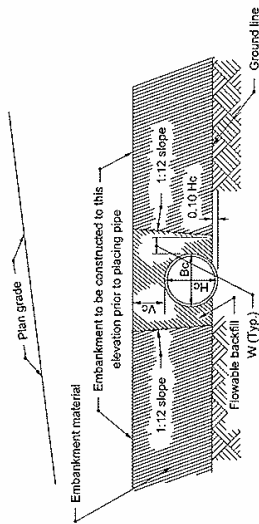
Structures under mainline pavement and public road approaches.



INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE STRUCTURE BACKFILL EMBANKMENT INSTALLATIONS	
MARCH 2003	
STANDARD DRAWING NO. E 715-BKFL-01	
DESIGNED BY JULY Anthony L. Urmanoch	DATE 3-03-03
CHECKED BY JULY Richard L. Smider	DATE 3-03-03
CHIEF HIGHWAY ENGINEER	

NOTE

1. Refer to Standard Drawing E 715-BKFL-09 for general notes.

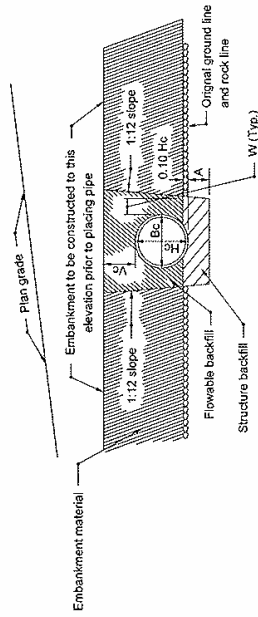


SECTION A-A

LEGEND

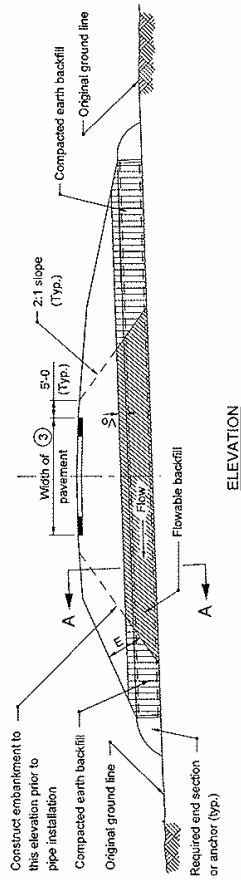
- Hc = Overall diameter or rise
- Bc = Overall diameter or span
- A = 8" min. for fill height up to 16"
- = 12" min. for fill height of 16' or more
- Vc = 12" for Bc ≤ 18"
- = 18" for Bc > 18"
- W = 6" for Bc ≤ 24"
- = 0.3 Bc for 24' < Bc ≤ 42"
- = 12" for Bc > 42"
- ⑦ E = Encasement

SECTION A-A
ROCK FOUNDATION

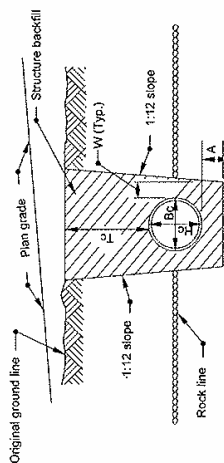


METHOD 1 BACKFILL

Structures under mainline pavement and public road approaches.



INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE STRUCTURE BACKFILL EMBANKMENT INSTALLATIONS	
MARCH 2005	
STANDARD DRAWING NO. E 715-BKFL-02	
DESIGNED BY Richard L. VanCleave DESIGN STANDARD ENGINEER	DATE 3/01/05
CHECKED BY Richard A. Swartz CHIEF HIGHWAY ENGINEER	DATE 3/01/05



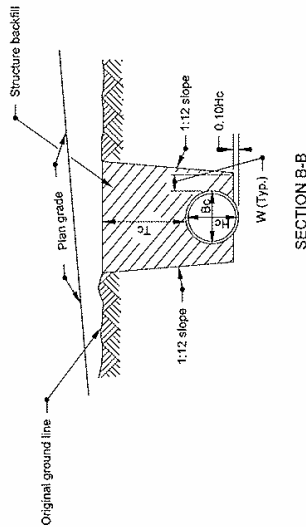
SECTION B-B
ROCK FOUNDATION

LEGEND

- Hc = Overall diameter or rise (Typ.)
- Bc = Overall diameter or span
- A = 8" min. for fill height up to 16"
- Tc = 12" min. for fill height of 16" or more
- W = 0.3 Bc or 9", whichever is greater
- E = Encasement

NOTE

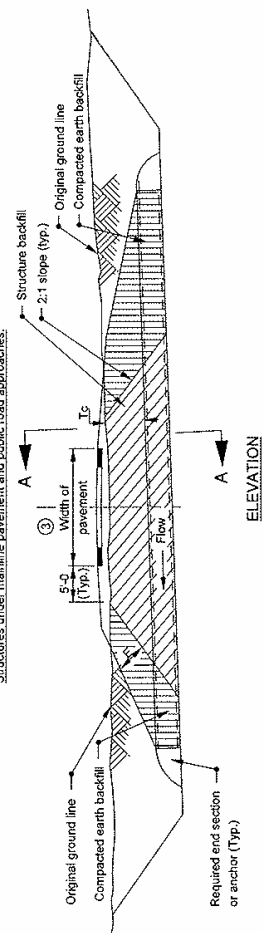
1. Refer to Standard Drawing E 715-BKFL-09 for general notes.



SECTION B-B

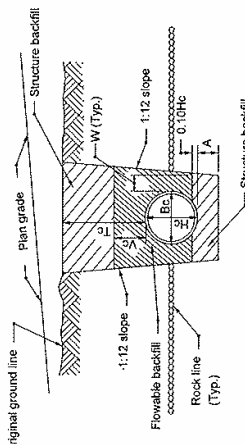
METHOD 1 BACKFILL

Structures under mainline pavement and public road approaches.



INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE STRUCTURE BACKFILL TRENCH INSTALLATIONS	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 715-BKFL-03	
DESIGNED BY Richard L. VanCleave	DATE 9-01-05
CHECKED BY Richard L. VanCleave	DATE 9-01-05
DESIGNED BY Richard L. VanCleave	DATE 9-01-05
CHECKED BY Richard L. VanCleave	DATE 9-01-05
DESIGNED BY Richard L. VanCleave	DATE 9-01-05
CHECKED BY Richard L. VanCleave	DATE 9-01-05

NOTE
1. Refer to Standard Drawing E 715-BKFL-03 for general notes.



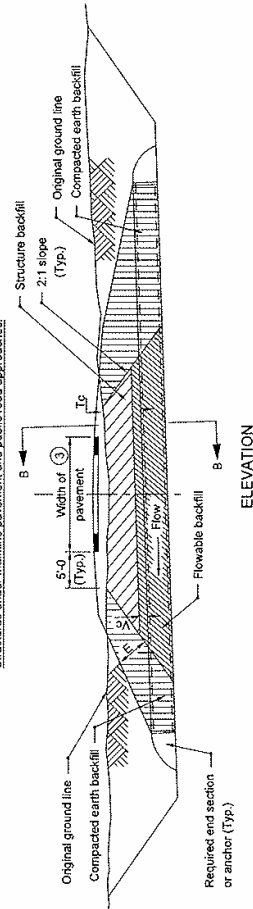
**SECTION B-B
ROCK FOUNDATION**

LEGEND

- Hc = Overall diameter or rise
- Bc = Overall diameter or span
- A = 8" min. for fill height up to 16"
- = 12" min. for fill height of 16' or more
- Tc = Trench cover depth
- Vc = 12" for Bc ≤ 18"
- = 18" for Bc > 18"
- W = 6" for Bc ≤ 21"
- = 0.3 Bc for 21" < Bc ≤ 42"
- = 12" for Bc > 42"
- ⑦ E = Encasement

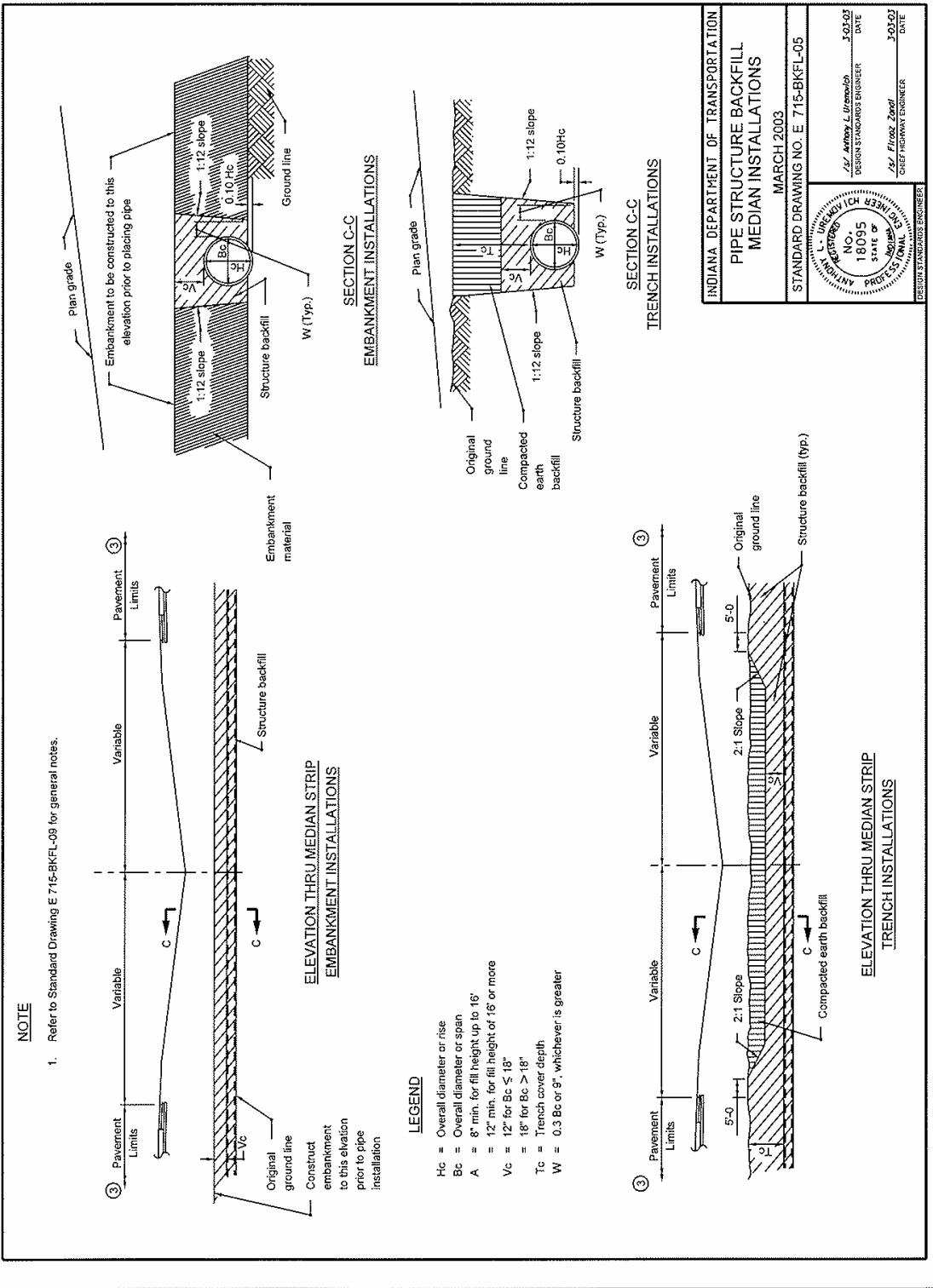
METHOD 1 BACKFILL

Structures under mainline pavement and public road approaches.

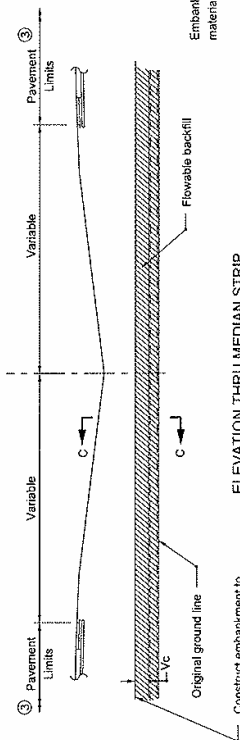


ELEVATION

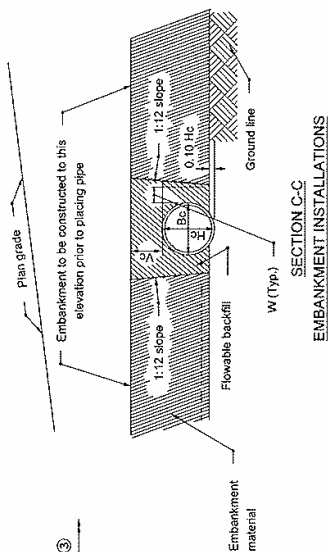
INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE STRUCTURE BACKFILL TRENCH INSTALLATIONS	
MARCH 2005	
STANDARD DRAWING NO. E 715-BKFL-04	
DESIGNED BY L. J. VANCE NO. 9750 STATE OF INDIANA	CHECKED BY J. J. VANCE DATE 3/05
DESIGNED BY L. J. VANCE NO. 9750 STATE OF INDIANA	CHECKED BY J. J. VANCE DATE 3/05
DESIGN STANDARD ENGINEER	



1. Refer to Standard Drawing E 715-BKFL-09 for general notes.



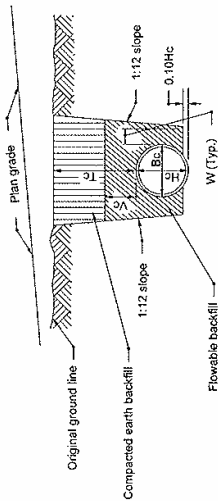
**ELEVATION THRU MEDIAN STRIP
EMBANKMENT INSTALLATIONS**



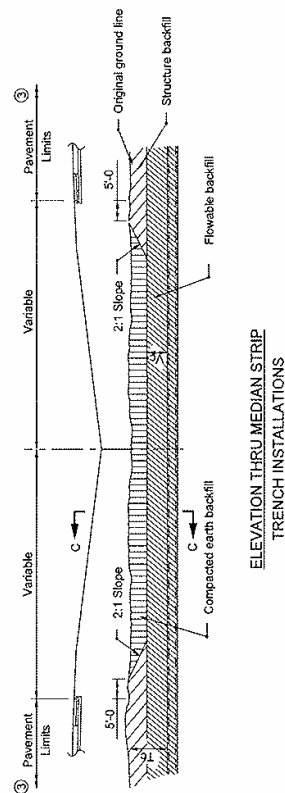
SECTION C-C



Hc = Overall diameter or rise
Bc = Overall diameter or span
A = 8" min. for fill height up to 16"
= 12" min. for fill height of 16" or more
Vc = 12" for Bc ≤ 18"
= 18" for Bc > 18"
Tc = Trench cover depth
W = 6" for Bc ≤ 21"
0.3 Bc for 21" < Bc ≤ 42"
12" for Bc > 42"



SECTION C-C
TRENCH INSTALLATIONS



ELEVATION THRU MEDIAN STRIP
TRENCH INSTALLATIONS

INDIANA DEPARTMENT OF TRANSPORTATION

PIPE STRUCTURE BACKFILL MEDIAN INSTALLATIONS

MARCH 2005

STANDARD DRAWING NO. E 715-BKFL-06

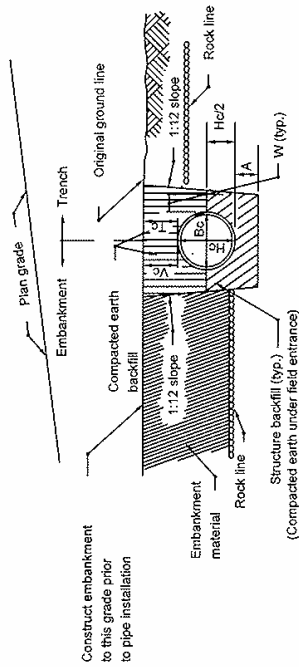
151 Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

151 Richard K. Smutzer 30105
CHIEF, MICHAEL V. ENCLINGER DAY

DESIGN STANDARDS ENGINEER

NOTES

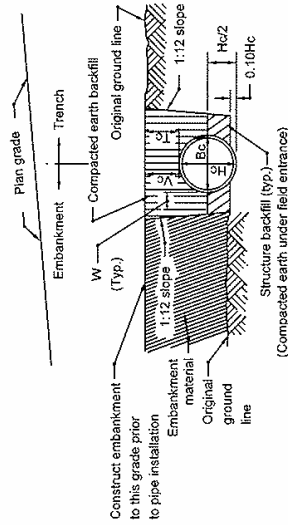
1. Refer to Standard Drawing E 715-BKFL-09 for general notes.



SECTION D-D EMBANKMENT/TRENCH INSTALLATION ROCK FOUNDATION

LEGEND

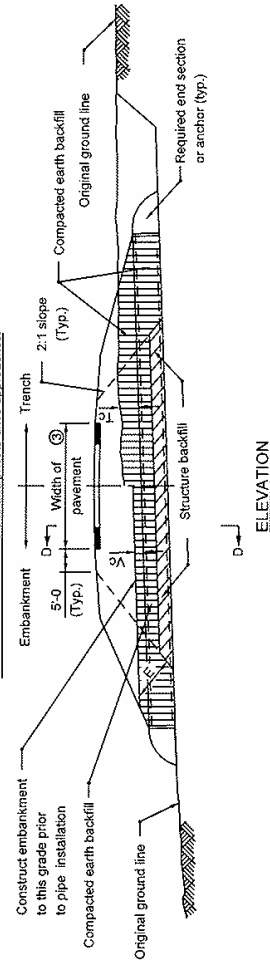
- Hc = Overall diameter or rise
- Bc = Overall diameter or span
- A = 8" min. for fill height up to 16"
- Vc = 12" min. for fill height of 16' or more
- Tc = 18" for Bc ≤ 18"
- Tc = 18" for Bc > 18"
- W = Trench cover depth
- W = 0.3 Bc or 9", whichever is greater
- ⊙ E = Encasement



SECTION D-D EMBANKMENT/TRENCH INSTALLATION

METHOD 2 BACKFILL

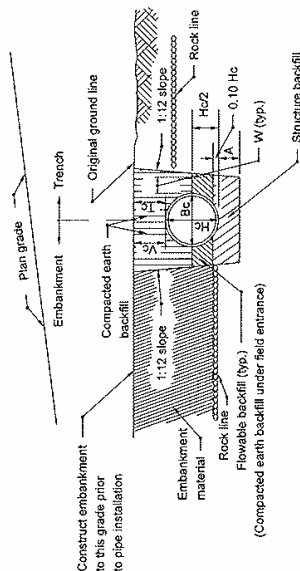
Structures under commercial and private drive approaches



INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE STRUCTURE BACKFILL DRIVEWAY INSTALLATIONS	
MARCH 2003	
STANDARD DRAWING NO. E 715-BKFL-07	
DESIGNED BY L. J. HENNING	CHECKED BY L. J. HENNING
DATE 3-03-03	DATE 3-03-03
DESIGNED BY L. J. HENNING	CHECKED BY L. J. HENNING
DATE 3-03-03	DATE 3-03-03

NOTES

1. Refer to Standard Drawing E 715-BKFL-09 for general notes.



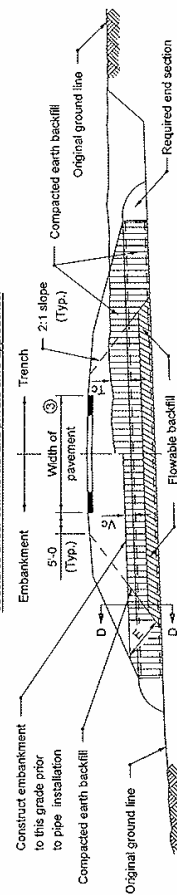
SECTION D-D
EMBANKMENT/TRENCH INSTALLATION
ROCK FOUNDATION

LEGEND

- Hc = Overall diameter or rise
- Bc = Overall diameter or span
- A = 8" min. for fill height up to 16'
- Vc = 12" min. for fill height of 16' or more
- Tc = 18" for Bc > 18"
- W = Trench cover depth
- W = 6" for Bc ≤ 21"
- W = 0.3 Bc for 21" < Bc ≤ 42"
- W = 12" for Bc > 42"
- E = Encasement

METHOD 2 BACKFILL

Structures under commercial and private drive approaches



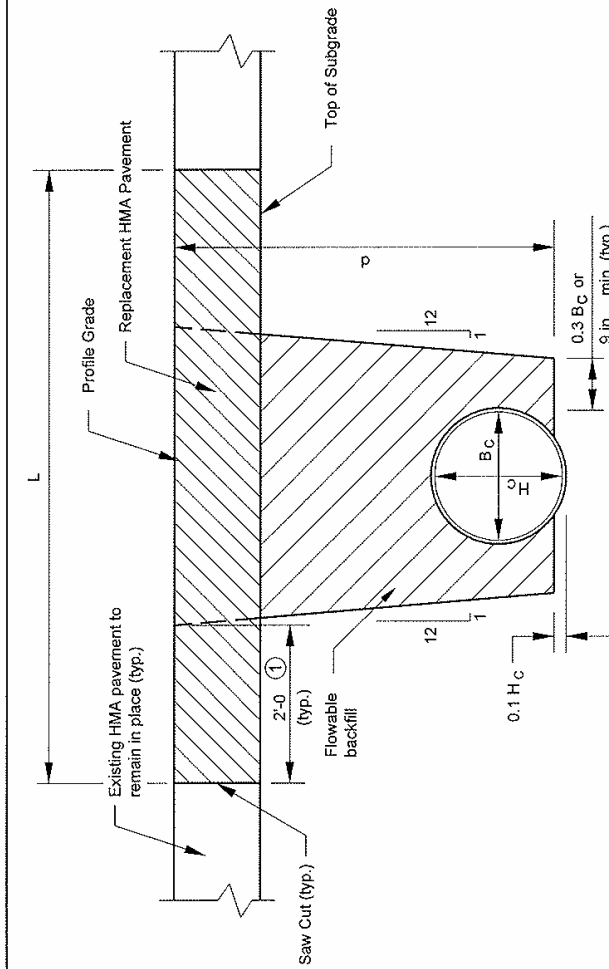
ELEVATION

INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE STRUCTURE BACKFILL DRIVEWAY INSTALLATIONS	
MARCH 2005	
STANDARD DRAWING NO. E 715-BKFL-08	
DESIGNED BY J.V. RICHARD L. VANCE	CHECKED BY J.V. RICHARD L. VANCE
DATE 3/04/05	DATE 3/04/05
DESIGNED BY J.V. RICHARD L. VANCE	CHECKED BY J.V. RICHARD L. VANCE
DATE 3/04/05	DATE 3/04/05
DESIGNED BY J.V. RICHARD L. VANCE	CHECKED BY J.V. RICHARD L. VANCE
DATE 3/04/05	DATE 3/04/05

GENERAL NOTES

1. Standard Drawing E 715-BKFL-01, 03, 05 and 07 illustrate the requirements for pipe installations utilizing structure backfill. Standard Drawings E 715-BKFL-02, 04, 06, and 08 illustrate the requirements for pipe installations using flowable backfill.
2. Protective cover shall be constructed prior to running heavy equipment over installed pipes. The minimum covers are listed below:
 - a.) 1.5' for $B_c \leq 18"$, where B_c = pipe diameter or span
 - b.) 3' for $18" < B_c \leq 54"$
 - c.) 4' for $B_c > 54"$
3. For backfill purposes, paved shoulders, curbs, and sidewalks are considered pavement.
4. Method 1 backfill shall be utilized for all Type 2 or 5 pipe installed parallel to the mainline or public road approaches and within 5'-0" of pavement. Method 2 backfill shall be utilized for 8-inch pipe installed outside 5'-0" from pavement.
5. If the existing ground line is less than V_c above the proposed top of pipe elevation, the embankment shall be constructed to at least V_c above the proposed top of pipe elevation prior to pipe installation. $V_c = 12"$ for $B_c \leq 18"$ and $V_c = 18"$ for $B_c > 18"$.
6. In paved median areas, structure backfill shall be utilized instead of compacted earth backfill between the V_c dimension above the pipe and the top of the trench.
7. Flowable or structure backfill shall be encased by compacted earth backfill. The minimum encasement shall be 2 feet. If necessary, the 2:1 slope between the flowable or structure backfill and the encasement shall be modified to maintain the minimum 2 feet encasement.
8. Flowable backfill shall be utilized for plastic pipes fabricated of non-hydraulic design basis rated resins and installed at locations where method 1 backfill is required.

INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE STRUCTURE BACKFILL	
MARCH 2005	
STANDARD DRAWING NO. E 715-BKFL-09	
	R/L Richard L. Yencove DESIGN STANDARDS ENGINEER DATE 3/0/05
	R/L Richard A. Smith CHIEF HIGHWAY ENGINEER DATE 3/0/05



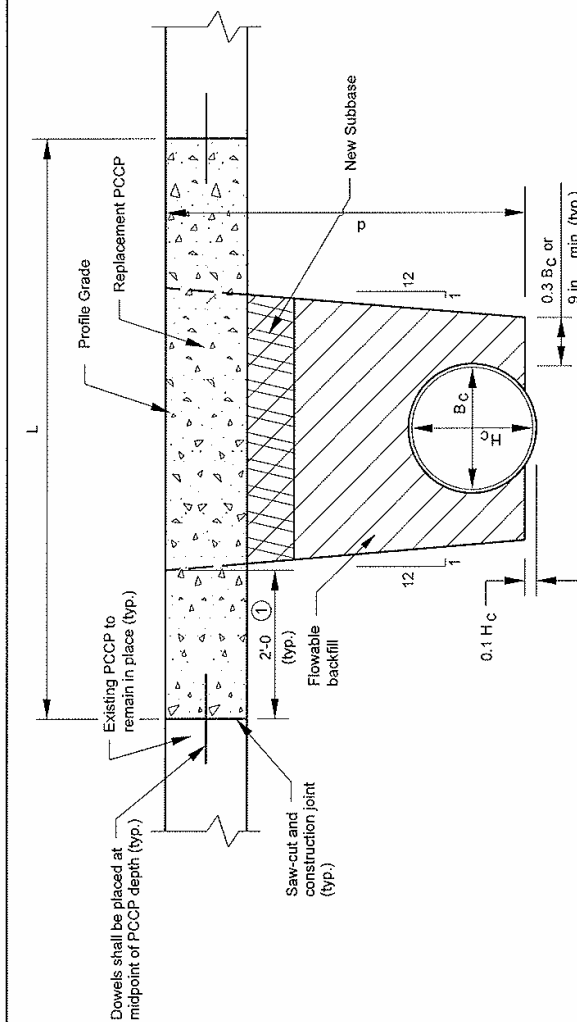
- L = Longitudinal pay limits of pavement removal and pavement replacement (ft)
 B_c = Inside diameter or span (in.)
 H_c = Inside diameter or rise (in.)
 d = Vertical distance from flowline to profile grade (ft)

Notes:

- ① Existing subgrade over this longitudinal distance shall remain in place.
2. The minimum pavement sections shall be as follows:
 HMA: 165 #/yd² HMA Surface, Type A, B, C, or D on
 275 #/yd² HMA Intermediate, Type A, B, C, or D on
 variable HMA Base, Type A, B, C, or D.
3. If underdrains are present, they shall be perpetuated in accordance with the details shown on Standard Drawing E 718-UNDR-01.

INDIANA DEPARTMENT OF TRANSPORTATION	
STRUCTURE REPLACEMENT UNDER EXISTING ROADWAY	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 715-BKFL-10	
	1st Richard L. Vancleave 9-9-05 DESIGN STANDARDS ENGINEER DATE 2nd Richard K. Smutzer 9-9-05 CHIEF HIGHWAY ENGINEER DATE

HMA REPLACEMENT PAVEMENT



L = Longitudinal pay limits of pavement removal and pavement replacement (ft)

B_c = Inside diameter or span (in.)

H_c = Inside diameter or rise (in.)

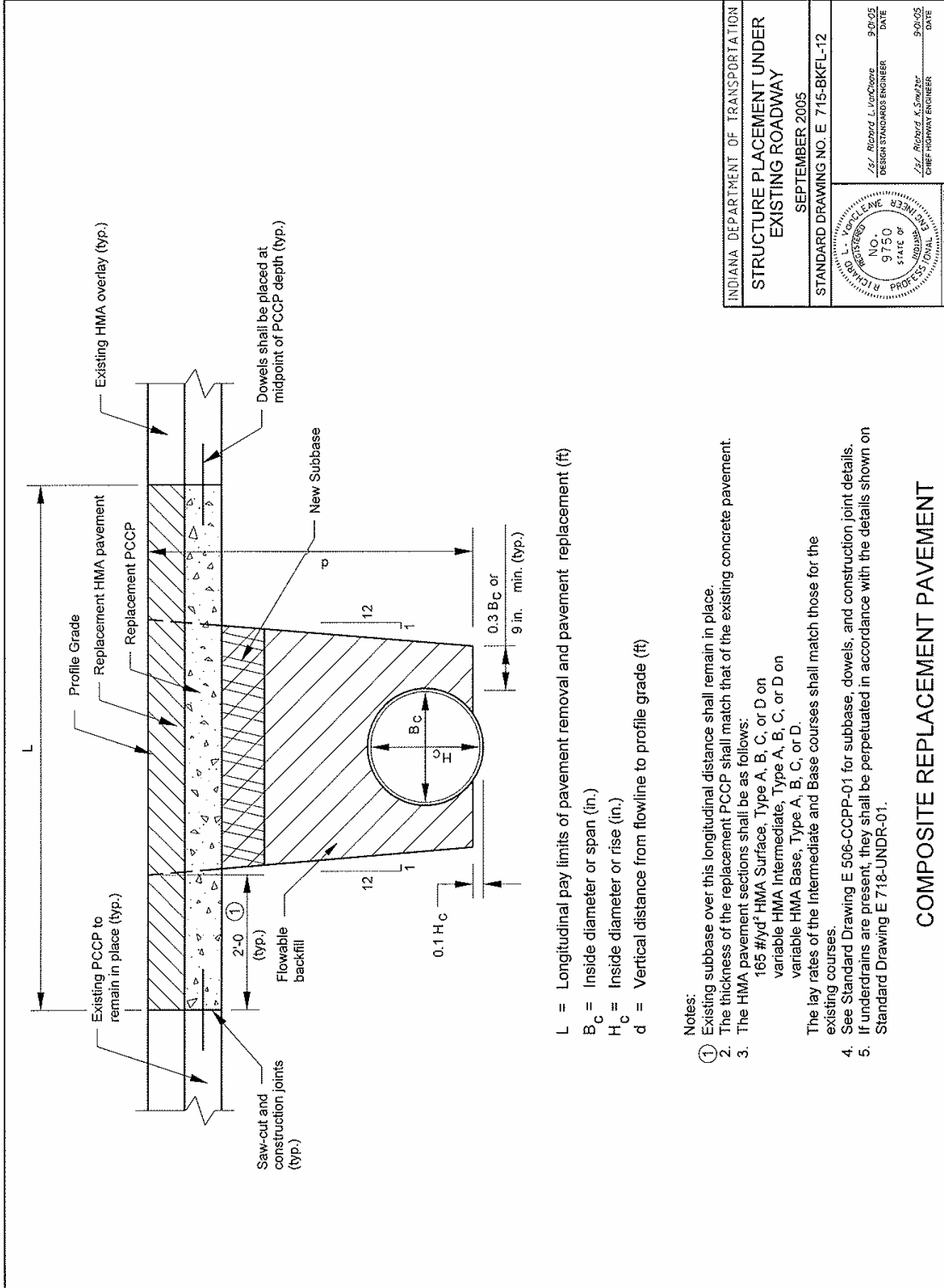
d = Vertical distance from flowline to profile grade (ft)

Notes:

- Existing subbase over this longitudinal distance shall remain in place.
- The thickness of the replacement PCCP shall match that of the existing concrete pavement.
- See Standard Drawing E 506-CCPP-01 for subbase, dowels, and construction joint details.
- If underdrains are present, they shall be perpetuated in accordance with the details shown on Standard Drawing E 718-UNDR-01.

PCCP REPLACEMENT PAVEMENT

INDIANA DEPARTMENT OF TRANSPORTATION	
STRUCTURE PLACEMENT UNDER EXISTING ROADWAY	
SEPTEMBER 2005	
STANDARD DRAWING NO. E 715-BKFL-11	
	R.L. Richard L. Vazirani DESIGN ENGINEER DATE 9/05
	R.L. Richard L. Vazirani CHIEF HIGHWAY ENGINEER DATE 9/05



REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 203, BEGIN LINE 73, DELETE AND INSERT AS FOLLOWS:

~~The Department will maintain a list of qualified wetland professional consultants. A wetland professional certified by the Society of Wetland Scientists, SWS, as a wetland professional in training or professional wetland scientists may also be utilized and a list of such scientists can be located at <http://www.wetlandcert.org/search.html>. The Department maintains a list of professional consultants who are prequalified to perform various types of work. A qualified wetland professional shall be a professional consultant who is prequalified with the Department to perform Environmental Services work types 5.4 Ecological Surveys, or certified by the Society of Wetland Scientists (SWS) as a wetland professional-in-training or professional wetland scientist. The Department's list of prequalified professional consultants is located at <http://www.in.gov/dot/div/legal/rfp/eligiblefirms.xls>.~~

Other sections containing
specific cross references:

None

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Recurring Special Provisions
potentially affected:

Standard Sheets potentially affected:

Motion: M

Second: M

Ayes:

Nays:

Action: Passed as submitted; revised

Effective: _____ Letting

_____ 2008 Standards Specifications Book

_____ 2008 Standards Edition

Withdrawn _____